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U.S. Geological Survey

MINERALS YEARBOOK

Area Reports: International 2014

Europe and Central Eurasia

Volume III

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U.S. Geological Survey

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Volume III

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U.S. DEPARTMENT OF THE INTERIOR
RYAN K. ZINKE, Secretary

U.S. GEOLOGICAL SURVEY
William H. Werkheiser, Deputy Director
exercising the authority of the Director

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Foreword

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This edition of the U.S. Geological Survey (USGS) Minerals Yearbook discusses the performance of the worldwide minerals and materials industries during 2014 and provides background information to assist in interpreting that performance. Content of the individual Minerals Yearbook volumes follows:

- Volume I, Metals and Minerals, contains chapters about virtually all metallic and industrial mineral commodities important to the U.S. economy. Chapters on survey methods, summary statistics for domestic nonfuel minerals, and trends in mining and quarrying in the metals and industrial mineral industries in the United States are also included.
- Volume II, Area Reports: Domestic, contains a chapter on the mineral industry of each of the 50 States and Puerto Rico and the Administered Islands. This volume also has chapters on survey methods and summary statistics of domestic nonfuel minerals.
- Volume III, Area Reports: International, is published as four separate reports. These regional reports contain the latest available minerals data on more than 190 foreign countries and discuss the importance of minerals to the economies of these nations and the United States. Each report begins with an overview of the region's mineral industries during the year. It continues with individual country chapters that examine the mining, refining, processing, and use of minerals in each country of the region and how each country's mineral industry relates to U.S. industry. Most chapters include production tables and industry structure tables, information about Government policies and programs that affect the country's mineral industry, and an outlook section.

The USGS continually strives to improve the value of its publications to users. Constructive comments and suggestions by readers of the Minerals Yearbook are welcomed.

William H. Werkheiser, Deputy Director

Contacts

Information about the U.S. Geological Survey, its programs, staff, and products may be accessed on the Internet at http://www.usgs.gov or by contacting the Earth Science Information Center at 1–888–ASK–USGS. For specific information about this publication, contact the Director, National Minerals Information Center, by mail at U.S. Geological Survey, 12201 Sunrise Valley Drive, 988 National Center, Reston, VA 20192, or by email at nmicrecordsmgt@usgs.gov, or by calling (703) 648–4961. Additional minerals information may be accessed at http://minerals.usgs.gov/minerals/.

Acknowledgments

The Country Specialists in the National Minerals Information Center, U.S. Geological Survey, in preparing the International Review regional books of volume III of the Minerals Yearbook, extensively use statistics and data on mineral production, consumption, and trade provided by various foreign Government minerals and statistical agencies through various official publications. The cooperation and assistance of these organizations are gratefully acknowledged. Statistical and informational material was also obtained from reports of the U.S. Department of State, United Nations publications, and the domestic and foreign technical and trade press. Of particular assistance were reports submitted by the Resource Reporting Officers and other officers of the Department of State in U.S. Embassies worldwide. Their contributions are sincerely appreciated. Internal statistical support was provided by the staff of the Data Collection and Coordination Section of the National Minerals Information Center. John H. DeYoung, Jr., Scientist Emeritus at the National Minerals Information Center, is acknowledged for his continued valuable contributions as a reviewer of these books.

The regimes of some countries reviewed in this volume may not be recognized by the U.S. Government. The information contained herein is technical and statistical in nature and is not to be construed as conflicting with or being contradictory of U.S. foreign policy.

Steven M. Fortier
Director, National Minerals Information Center

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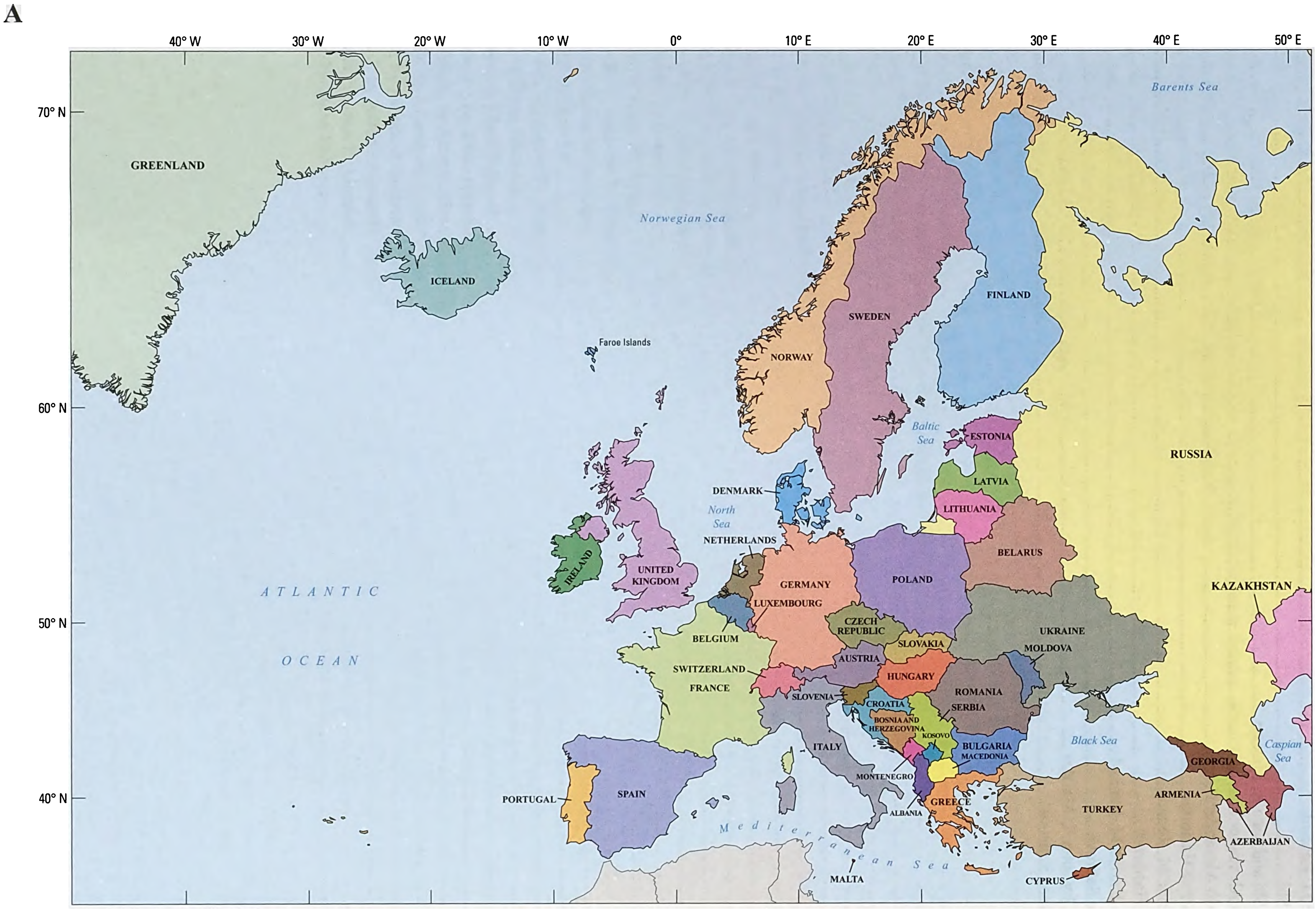

Base modified from ESRI ArcGIS online world countries (generalized) map data, 2017
Mercator Auxiliary Sphere projection
World Geodetic System 1984 datum

Figure 1. Map of the Europe and Central Eurasia region. The countries covered in this report are labeled on the map; bordering countries are shown in gray and not labeled.

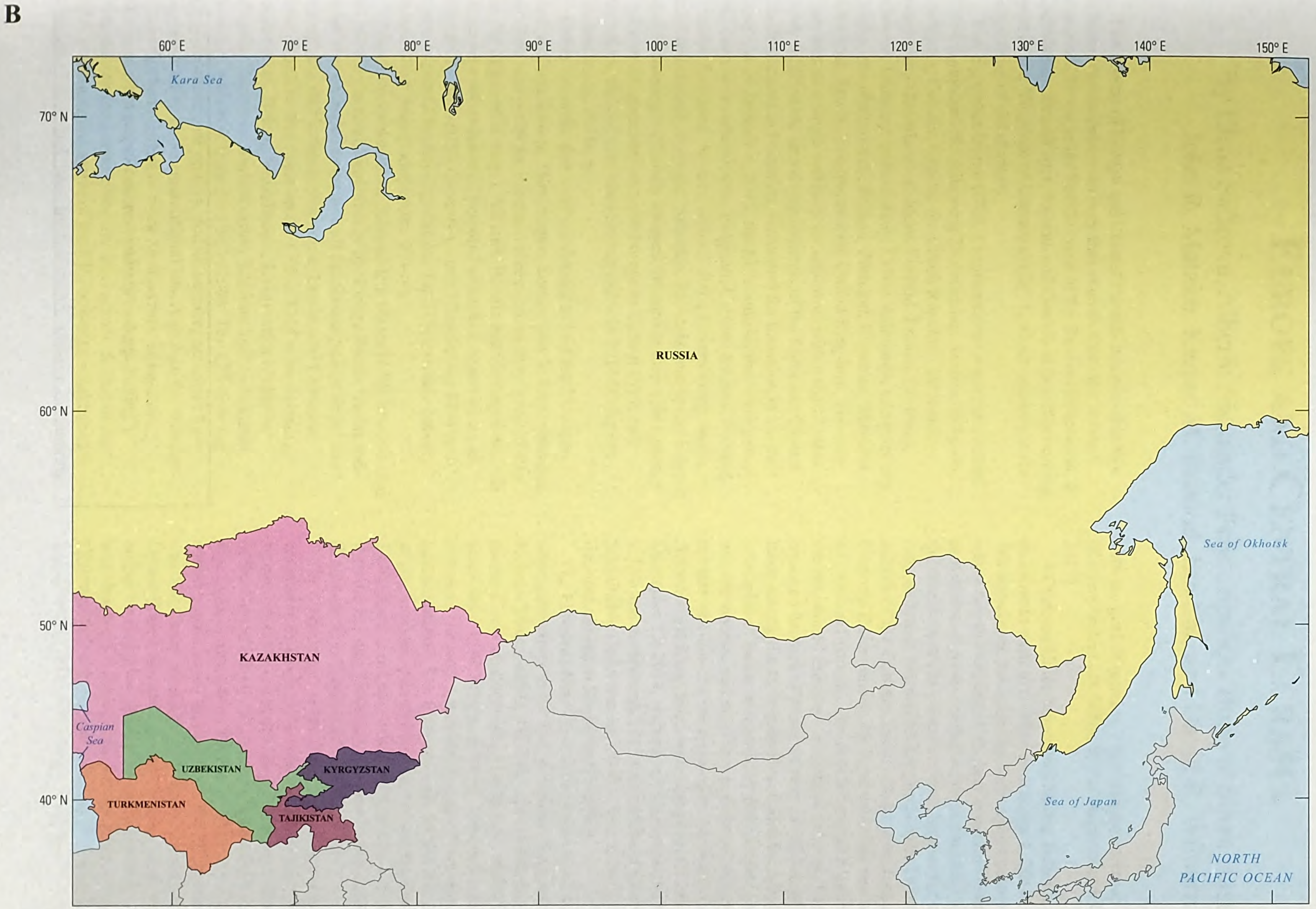

Figure 1. —Continued.

Figure 1 appears on the previous two pages.

THE MINERAL INDUSTRIES OF EUROPE AND CENTRAL EURASIA

By Elena Safirova, Alberto Alexander Perez, Spencer Buteyn, Sinan Hastorun, John R. Matzko, Karine M. Renaud, Lin Shi, and David R. Wilburn

The region of Europe and Central Eurasia as defined in this volume encompasses territory that extends from the Atlantic coast of Europe to the Pacific coast of the Russian Federation. It includes the British Isles, Iceland, and Greenland (a self-governing part of the Kingdom of Denmark) (fig. 1, which appears at the beginning of the chapter).

The European Union (EU), a supranational entity, at yearend 2014 comprised the following 28 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark (including Greenland), Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. The euro operates as a single currency for countries within the EU that have fulfilled the stated requirements of the European Central Bank (located in Frankfurt, Germany) for inclusion in the euro area. As of January 1, 2015, the EU countries that were part of the euro area were Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain. Kosovo and Montenegro officially adopted the euro as their sole currency without an agreement with the European Central Bank and, therefore, did not have euro-issuing rights in 2014 (European Commission, 2014a, b).

Other countries that were candidates to join the EU were Iceland, Macedonia, Montenegro, Serbia, and Turkey (although no date was given for expected accession, as they were all still in the negotiation stage). Albania, Bosnia and Herzegovina, and Kosovo were considered potential candidate countries under United Nations (UN) Security Council Resolution 1244 and were expected to start negotiations for EU candidate country status (European Commission, 2014a).

The Commonwealth of Independent States (CIS) was founded in 1991 by several Republics of the former Soviet Union and later was extended to include all the former Soviet Republics except the Baltic States of Estonia, Latvia, and Lithuania. The countries that made up the CIS in 2014 were Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan. Georgia withdrew from the CIS in 2008. The CIS does not have supranational powers, and all member countries have equal standing under international law. Although the member countries had pledged to work on economic integration, few actual measures had been taken to make the CIS a functioning integrated economic bloc similar to that of the EU. Some member states of the CIS, however, established a Customs Union and, later, the Eurasian Economic Community with the goal of creating a full-fledged common market (Korrespondent.net, 2008; Soyuz Nezavisimyh Gosudarstv, 2017).

A Customs Union agreement among Belarus, Kazakhstan, and Russia went into effect on January 1, 2010. According to this agreement, the countries form a joint customs territory where no customs duties or other economic restrictions on the movement of goods among the three countries apply. Each of the members of the Customs Union applies the same customs rates and trade regulations for goods traded with countries outside of the Customs Union. Starting on January 1, 2012, the Customs Union among the three countries was transformed into a Common Economic Space (CES), which was the next step in the envisioned Eurasian integration process. The CES agreement removed barriers to the movement of capital, goods, and labor among the three countries. It also included coordinated principles of business regulation and coordination of macroeconomic and monetary policies, although it did not imply the introduction of a common currency. Accession treaties for Armenia and Kyrgyzstan were signed on October 9, 2014, and December 23, 2014, respectively. Armenia and Kyrgyzstan were to become members in 2015 (International Centre for Trade and Sustainable Development, 2010; Utro.ru, 2012; Evraziyskoye Economicheskoye Soobshestvo, 2016).

The European Free Trade Association (EFTA), which is an alternative entity to the EU in Western Europe, was composed of Iceland, Liechtenstein, Norway, and Switzerland. The agreement on the European Economic Area (EEA), which had been in force since 1994, brings all 28 EU members and 3 of the EFTA members (Iceland, Liechtenstein, and Norway) into a single internal market. The EEA provides for the free movement of goods, services, persons, and capital among the 31 EEA states. Switzerland is not part of the EEA but has a bilateral agreement with the EU that addresses the same issues covered by the EEA (European Free Trade Association, 2016).

The 50 countries of the Europe and Central Eurasia region covered in this volume encompass an area of 30.1 million square kilometers, which is about three times larger than that of the United States; 17.1 million square kilometers of the area is accounted for by Russia. In 2014, the 50 countries had a total population of 902 million. The EU population in 2014, was 508.2 million, which was about 59% larger than that of the United States. The total gross domestic product (GDP) based on purchasing power parity of the 50 countries in the region was about $26.5 trillion, and the weighted average per capita GDP was $29,431; the per capita GDP ranged from $2,698 in Tajikistan to $96,035 in Luxembourg (tables 1, 2).

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- Austria—Bundesministerium für Wirtschaft, Familie und Jugend;
- Azerbaijan—The State Statistical Committee;
- Belarus—National Statistical Committee (BelStat);
- Belgium—Statistics Belgium (StatBel);
- Bosnia and Herzegovina—Agency for Statistics of Bosnia and Herzegovina;
- Cyprus—The Mine Service; Ministry of Agriculture, Natural Resources and Environment;
- Czech Republic—Czech Geological Survey;
- Estonia—Geological Survey of Estonia;
- Georgia—National Statistics Office of Georgia (GEOSTAT);
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- Greece—Government of Greece;
- Hungary—Magyar Köztársaság Gazdasági Ès Közlekedési Minisztérium Magyar Geológiai Szogálat (Hungarian Geological Survey);
- Iceland—Statistics Iceland;
- Kazakhstan—Agency on Statistics;
- Kosovo—Independent Commission for Mines and Minerals (ICMM);
- Latvia—Central Statistical Bureau of Latvia;
- Lithuania—Statistics Lithuania;
- Macedonia—State Statistical Office;
- Malta—Ministry for Transport and Infrastructure;
- Moldova—National Bureau of Statistics of the Republic of Moldova;
- Montenegro—Statistical Office of the Republic of Montenegro;
- Norway—Geological Survey of Norway;
- Poland—Central Statistical Office;
- Portugal—Instituto Geológico Minero (IGM), Division of Statistical Studies;
- Slovakia—Statistical Office of the Slovak Republic;
- Slovenia—Slovenian Government;
- Sweden—Geological Survey of Sweden;
- Switzerland—Central Statistics Office;
- Tajikistan—Agency on Statistics under the President of the Republic of Tajikistan;
- Turkey—Turkish Statistical Institute;
- Ukraine—State Statistics Committee; and
- United Kingdom—British Geological Survey.

General Economic Conditions

In 2014, economic trends in the region were shaped by three major developments—a steep decrease in oil prices, quantitative easing programs conducted by the European Central Bank, and a dramatic slowdown in Russia following the introduction of sanctions imposed by the Western countries for Russia's annexation of the Crimean Peninsula. Overall, the countries in Europe and Central Eurasia were experiencing economic development at three different rates. Countries of the Baltics, Central and Eastern Europe, and Turkey saw rather stable growth fueled by labor market improvements, increases in domestic consumption, and benefits from reduced petroleum prices. Countries in southeastern Europe experienced sluggish growth, as the negative effects of high debt outweighed the benefits of lower oil prices. Finally, CIS economies continued to slow down and were expected to contract in 2015. Most of the slowdown was expected to take place in Russia and Ukraine because of geopolitical tensions and, in the case of Russia, lower oil prices. Although the economy of the region as a whole had average growth of 1.5%, the economies of a number of countries in the region grew at a much faster rate in 2014, including that of Turkmenistan (which expanded by 10.3%), Uzbekistan (8.1%), Tajikistan (6.7%), Ireland (5.2%), Moldova (4.8%), Georgia (4.6%), Kazakhstan (4.3%), and Luxembourg and Malta (4.1% each) (table 2; International Monetary Fund, 2015, p. 1–66; World Bank, The, 2015, p. 61–68).

Exploration

Information herein on the exploration activities for Europe and Central Eurasia is based on site data compiled by the U.S. Geological Survey (USGS) and economic data estimated by SNL Metals & Mining (SNL). SNL included countries in this region in a grouping of projects, including mainland Asia, the CIS, Europe, and the Middle East. SNL reported that the composite exploration budget in its 2014 survey decreased by about 13% to about $2 billion from the $2.4 billion budget reported in its 2013 survey. The exploration budget for Russia was reported to account for about 5% of the total global exploration budget. Other countries in the region (excluding China) with a 2014 exploration budget estimated by SNL to be greater than $50 million were, in decreasing order by budget, Kazakhstan, Turkey, Sweden, and Finland (SNL Metals & Mining, 2014).

Based on active exploration site data compiled by the USGS, the greatest amount of exploration in Europe and Central Eurasia took place primarily in, in decreasing order of exploration amount, Russia, Turkey, Sweden, Spain, Kazakhstan, Finland, and Serbia. Russia accounted for about 28% of the sites actively being explored in the region; Turkey, about 9%; Spain and Sweden, about 8% each; and Kazakhstan and Finland, about 6% each. The remaining 35% took place in 25 other countries located in the CIS and Europe. A couple of noteworthy exploration sites in Kazakhstan and Turkey are listed in table 3.

Exploration activity in the CIS focused on precious metals (67%), base metals (28%), iron ore (3%), and other mineral commodities (2%). European mineral exploration focused primarily on base metals (37%), precious metals (32%), tungsten (8%), iron ore (6%), and other mineral commodities (17%). Exploration in Turkey primarily focused on gold (57%), copper (29%), zinc (4%), and other mineral commodities (10%).

Kazakhstan, Russia, and Uzbekistan had increased investment in uranium exploration and development in recent years, leading to increased uranium production in these countries. Large uranium deposits in Russia are located in Yakutia and the Trans-Baikal region, and several new mines in northern Kazakhstan and the Chu-Sarysu region were being considered for development in Kazakhstan. Resource investments in Russia's Far East reportedly increased to $1.9 billion in 2014 from $715 million in 2013 through a number of public-private partnerships in the mining sector. A joint decision to explore for metals, including beryllium, cesium, lithium, niobium, rubidium, and tantalum, in the Juzkuduk and the Tamdiykuduk-Tulyantash regions of Uzbekistan was agreed upon by the Japan Oil, Gas, and Metals National Corp. (JOGMEC) and the Uzbek State Committee on Geology and Mineral Resources (Hirtenstein, 2014; Jafarova, 2014; Vorotnikov, 2014).

Commodity Overview

This report includes a regional production table (table 4) and mineral commodity outlook tables. In tables 5 through 20, estimates for the production of major mineral commodities for 2016 and beyond have been based upon supply-side assumptions, such as announced plans for increased production, new capacity construction, and bankable feasibility studies. The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the historic data are estimated or reported, and revisions are not identified. Data on individual mineral commodities in the tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables 5 through 20 are based on projected trends that could affect current (2014) producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within the indicated timeframes. Forward-looking information, which includes estimates of future production, exploration, and mine development, cost of capital projects, and timing of the start of operations, is subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a USGS prediction of what will take place.

Uranium production in the Europe and Central Eurasia region accounted for 58.1% of the world's production [measured in uranium oxide (U_3O_8) content]; lignite coal, 53.8%; and potash (K_2O equivalent), 44.3%. The region's output of titanium sponge accounted for 40.0% of world production; refined palladium, 42.8%; secondary aluminum, 39.2%; refined platinum, 37.8%; refined nickel metal, 36.7%; chromite, 30.3%; ammonia (N content), 22.8%; zinc metal, 21.8%; and secondary lead, 22.9%. The region was practically self-sufficient in the production of construction materials and remained among the world's leading producers of natural gas (23.9% of world production). Russia accounted for 29.5% of total natural diamond (gemstone and industrial) production in the world. The region was a leading crude oil producer (18.0% of world production) and had significant coal reserves (table 4).

Metals

Bauxite and Alumina and Aluminum.—In 2014, Russia and Kazakhstan produced the majority of bauxite output in the region, accounting for 5.5 million metric tons (Mt) and 4.5 Mt, respectively. By 2020, bauxite production was likely to remain about the same in Russia and to increase slightly in Kazakhstan to projected output levels of 5.5 million metric tons per year (Mt/yr) and 4.9 Mt/yr, respectively. In 2014, Russia was the leading source of alumina in Europe and Central Eurasia, with annual production of 2.6 Mt. Ireland ranked second with 2.0 Mt, and was followed by Ukraine (1.5 Mt) and Kazakhstan and Spain (1.4 Mt each) (tables 4, 5).

In 2014, Russia, which was the leading producing country of primary and secondary aluminum in Europe and Central Eurasia, produced 3.3 Mt. The next-ranked producers in the region were Norway (1.5 Mt), Germany (1.1 Mt), and Italy (1.0 Mt). The projected output of primary and secondary aluminum in Russia was expected to increase slightly through 2020. Production capacities in Germany, Italy, and Norway were not expected to change significantly through 2020 (tables 4, 6).

Cobalt.—In 2014, the only countries in the Europe and Central Eurasia region that produced mined cobalt were Finland, which produced about 12,600 metric tons (t), and Russia, which produced about 6,300 t. By 2020, the production capacity of both countries was expected to remain unchanged (table 7).

Copper.—In 2014, Russia was the region's leading producer of both mined copper and refined copper. Russia's mine production of copper (Cu content) was projected to increase to 940,000 metric tons per year (t/yr) by 2020 from 860,000 t in 2014. Other top producers of mined copper in the region in 2014 were Poland (473,000 t), Kazakhstan (460,000 t), Spain (106,000 t), Uzbekistan (99,000 t), and Turkey (97,000 t). Russia's production of refined copper was 892,000 t in 2014 and was projected to increase to 950,000 t by 2020. Other leading producers of refined copper in the region in 2014 were Germany (677,000 t), Poland (577,000 t), Belgium (385,000 t), and Spain (347,000 t). Production in Belgium, Germany, Poland, and Spain was expected to remain at about the same level through 2020 (tables 8, 9).

Gold.—In 2014, Europe and Central Eurasia accounted for about 14.9% of world gold production; the majority of the gold produced in the region came from Central Eurasia. The principal producers, by weight, were Russia, which produced about 246,900 kilograms (kg) of gold, followed by Uzbekistan (100,000 kg), Kazakhstan (about 49,200 kg), Turkey (31,300 kg), Kyrgyzstan (18,000 kg), and Finland (about 9,400 kg). Russia's production of gold was projected to increase to 275,000 kilograms per year (kg/yr) by 2020, and that of Uzbekistan and Kazakhstan was projected to increase to 107,000 kg/yr and 75,000 kg/yr, respectively. Russia, Uzbekistan, and Kazakhstan were projected to remain the principal producers of gold in the Europe and Central Eurasia region through 2020 (table 10).

Iron and Steel.—Europe and Central Eurasia produced about 17.9% of the world's crude steel output, and 15.4% of the world's pig iron and direct-reduced iron output in 2014. Russia was the leading producer of crude steel in the region; its output in 2014 was 70.5 Mt, which was a slight increase compared with that of 2013. Germany was the second-ranked producer, by production amount, with production of 42.9 Mt; followed by Turkey, 34.0 Mt; Ukraine, 27.4 Mt; and Italy, 23.7 Mt (tables 4, 12).

Iron Ore.—Europe and Central Eurasia produced 8.8% of the world's iron ore in 2014 (a decrease of 1.0% compared with that of 2013). Russia produced 60.2 Mt of iron ore, measured in iron content (the same as in the previous year); Ukraine produced 37.6 Mt (2.8% less than that of 2013); Sweden, 16.0 Mt (a slight decrease); and Kazakhstan, 14.9 Mt (a 3.5% increase compared with that of 2013). Production in the region was expected to remain unchanged through 2020 (table 11).

Lead and Zinc.—Europe and Central Eurasia produced about 11.4% of the world's mine output of lead (by lead content) and about 16.1% of primary lead metal production. Russia, Turkey, Poland, and Sweden were the principal producers of mined lead, accounting for 225,000 t, 98,000 t, 77,000 t, and 70,800 t, respectively. Other producers of note were Ireland (41,000 t) and Kazakhstan (37,800 t). Germany was the principal producer of primary lead metal in the Europe and Central Eurasia region with production of 160,000 t, followed by the United Kingdom (150,000 t), Kazakhstan (125,000 t), Russia (90,000 t), Bulgaria (93,400 t), and Sweden (69,000 t) (table 4).

Europe and Central Eurasia produced about 11.6% of the world's mine output of zinc (by zinc content) and about 21.8% of the world's zinc metal output in 2014. Kazakhstan and Ireland were the leading producers of zinc ore (measured as zinc content) and produced 346,600 t and 283,000 t, respectively. Other significant zinc ore (zinc content) producers were Russia (250,000 t), Sweden (221,900 t), Turkey (210,000 t), Portugal (67,400 t), and Poland (56,000 t). The principal producers of primary and secondary zinc metal in Europe and Central Eurasia in 2014 were Spain, which produced 527,000 t; Kazakhstan, 325,000 t; Belgium and Finland, 302,000 t each; the Netherlands, 290,000 t; and Russia, 223,000 t (table 4).

Nickel.—In 2014, Europe and Central Eurasia accounted for 16.0% of the world's mined nickel and 36.7% of the world's refined nickel production. The region's mine output of nickel was largely the result of Russian mining activity, and refined nickel production took place mainly in Russia and Western Europe. Russia accounted for about 79.7% of nickel mine output and 19.0% of nickel refinery production (nickel content) in the region in 2014 (table 13).

Regional production of refined nickel was more dispersed across countries than that of mined nickel. Russia produced 243,000 t in 2014, and Norway, Finland, and the United Kingdom produced 92,000 t, 43,000 t, and 40,000 t, respectively (table 4; fig. 2, which follows the tables at the end of this chapter).

Platinum-Group Metals.—Within the region of Europe and Central Eurasia, almost all mining for platinum-group metals (PGMs) took place in Russia, although small amounts of PGMs were also produced in Poland and Serbia. In 2014, Russia and South Africa were the world's leading PGM ore producers; Russia was the world's leading producer of palladium, accounting for 82,700 kg, or 42.8% of the world's production. Russia also produced 23,500 kg of platinum (tables 14, 15).

In 2014, the region of Europe and Central Eurasia accounted for 39% of the world output of refined PGMs, including both primary and secondary. Russia produced 26% of the world total, and Germany, 13% (fig. 2; table 4).

Tin.—In 2014, Europe and Central Eurasia produced only 0.2% of total world output of mined tin and did not produce any tin metal. Russia and Portugal were the only producers of mined tin in the region. Russia's tin mine production was at a low level, and the country was trying to revive its tin industry; the country's production was expected to increase by 2020 (tables 4, 16, and 17).

Titanium.—In 2014, Europe and Central Eurasia produced 40% of total world output of titanium sponge (titanium content). Of this amount, Russia accounted for 28%, Kazakhstan, 8%, and Ukraine, 4% (fig. 2; table 4).

Industrial Minerals

Diamond.—Russia was the world's leading diamond producer and the only diamond mining country in Europe and Central Eurasia. Almost all Russia's output of diamond was mined by the Joint Stock Company ALROSA of Russia, which had its main operation in Sakha Republic (Yakutiya) in Eastern Siberia. ALROSA was one of the world's leading companies in diamond exploration, diamond mining, sales of rough diamond, and diamond processing. The company accounted for about 97% of Russia's diamond production. Russia's share of global natural diamond production was 29.5% in 2014 (tables 4, 18).

Lithium.—Portugal was the only lithium producer in the region. In 2014, lithium production in Portugal decreased to 17,500 t from 40,100 t in 2010. By 2020, lithium production was expected to remain at about the same level (table 19).

Potash.—In 2014, Europe and Central Eurasia produced 18.6 Mt of potash (in K_2O equivalent), or 44.3% of world production. Russia was the leading regional potash producer in 2014, with output of 7.4 Mt, followed by Belarus (about 6.3 Mt) and Germany (about 3.1 Mt) (fig. 2; table 4).

Mineral Fuels and Related Materials

Coal.—In 2014, Europe and Central Eurasia accounted for 53.8% of the world's lignite production, 7.8% of the world's bituminous coal production, and 4.3% of the world's anthracite coal production. In Central Eurasia, Kazakhstan, Russia, and Turkey were the leading coal producers, and within the EU, Germany and Poland were the leading coal producers. A number of other countries throughout the region also mined coal. Germany produced 17% of world output of lignite; Poland, Russia, and Turkey, 6% each, and Greece, 5% (fig. 2; tables 4, 20).

Uranium.—In 2014, Europe and Central Eurasia accounted for 58.1% of the world's uranium production. Kazakhstan was the leading uranium producer in the world, and its production amounted to 26,900 t (U_3O_8 content), which accounted for 41.7% of world output, followed by Russia, Uzbekistan, Kyrgyzstan, and Ukraine, which together accounted for another 15.8% of world production. Uranium was also mined in the Czech Republic, Germany, and Romania but in smaller quantities (fig. 2; table 4).

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TABLE 1
EUROPE AND CENTRAL EURASIA: AREA AND POPULATION IN 2014

Country	Area[1] (square kilometers)	Estimated population[2] (thousands)
Albania	28,748	2,894
Armenia	29,743	3,006
Austria	83,871	8,546
Azerbaijan	86,600	9,535
Belarus	207,600	9,470
Belgium	30,528	11,231
Bosnia and Herzegovina	51,197	3,818
Bulgaria	110,879	7,224
Croatia	56,594	4,238
Cyprus	9,251	1,154
Czech Republic	78,867	10,525
Denmark, including Greenland and Faroe Islands	2,210,573	5,743
Estonia	45,228	1,315
Finland	338,145	5,462
France	551,500	66,218
Georgia	69,700	3,727
Germany	357,022	80,971
Greece	131,957	10,870
Hungary	93,028	9,863
Iceland	103,000	327
Ireland	70,273	4,616
Italy	301,340	60,789
Kazakhstan	2,724,900	17,289
Kosovo	10,887	1,823
Kyrgyzstan	199,951	5,836
Latvia	64,589	1,994
Lithuania	65,300	2,932
Luxembourg	2,586	556
Macedonia	25,713	2,076
Malta	316	427
Moldova	33,851	3,556
Montenegro	13,812	622
Netherlands	41,543	16,865
Norway	323,802	5,137
Poland	312,685	38,012
Portugal	92,090	10,401
Romania	238,391	19,904
Russia	17,098,242	143,820
Serbia	77,474	7,129
Slovakia	49,035	5,419
Slovenia	20,273	2,062
Spain	505,370	46,476
Sweden	450,295	9,696
Switzerland	41,277	8,188
Tajikistan	144,100	8,296
Turkey	783,562	75,932
Turkmenistan	488,100	5,307
Ukraine	603,550	45,363
United Kingdom	243,610	64,559
Uzbekistan	447,400	30,758
Regional Total	30,148,348	901,977
World total	148,940,000	7,259,692

[1] Source: U.S. Central Intelligence Agency, The World Factbook.

[2] Source: The World Bank, 2016 World Development Indicators Database.

TABLE 2

EUROPE AND CENTRAL EURASIA: GROSS DOMESTIC PRODUCT[1, 2]

Country	Gross domestic product in 2014 based on purchasing power parity		Real gross domestic product growth rate (percent)		
	Gross value (million dollars)	Per capita (dollars)	2012	2013	2014
Albania	31,495	10,884	1.4	1.1	2.0
Armenia	24,340	8,154	7.1	3.3	3.5
Austria	396,806	46,640	0.8	0.3	0.4
Azerbaijan	165,938	17,762	2.2	5.8	2.8
Belarus	172,755	18,246	1.7	1.0	1.6
Belgium	482,603	43,074	0.2	0.0	1.3
Bosnia and Herzegovina	39,037	10,084	-0.9	2.4	1.1
Bulgaria	131,591	18,271	0.2	1.3	1.5
Croatia	88,733	20,937	-2.2	-1.1	-0.4
Cyprus	27,345	32,285	-2.4	-5.9	-2.5
Czech Republic	315,864	30,047	-0.9	-0.5	2.0
Denmark, including Greenland	253,199	44,995	-0.1	-0.2	1.3
Estonia	36,784	27,955	5.2	1.6	2.9
Finland	221,810	40,690	-1.4	-0.8	-0.7
France	2,591,170	40,498	0.2	0.7	0.2
Georgia	34,305	9,198	6.4	3.4	4.6
Germany	3,748,094	46,160	0.6	0.4	1.6
Greece	283,795	25,972	-7.3	-3.2	0.7
Hungary	248,574	25,167	-1.7	1.9	3.7
Iceland	14,433	44,317	1.2	4.4	2.0
Ireland	236,398	51,284	0.2	1.4	5.2
Italy	2,133,167	35,095	-2.8	-1.7	-0.3
Kazakhstan	420,007	24,108	5.0	6.0	4.3
Kosovo	16,669	9,144 [3]	2.8	3.4	1.2
Kyrgyzstan	19,229	3,262	-0.9	10.5	3.6
Latvia	47,300	23,632	4.0	3.0	2.4
Lithuania	80,259	27,370	3.8	3.5	3.0
Luxembourg	52,790	96,035	-0.8	4.3	4.1
Macedonia	27,733	13,402	-0.5	2.9	3.5
Malta	14,451	33,971	2.9	4.0	4.1
Moldova	17,812	5,007	-0.7	9.4	4.8
Montenegro	9,547	15,353	-2.7	3.5	1.8
Netherlands	808,796	47,960	-1.1	-0.5	1.0
Norway	347,239	67,341	2.7	1.0	2.2
Poland	960,537	25,265	1.6	1.3	3.3
Portugal	282,753	27,185	-4.0	-1.1	0.9
Romania	394,980	19,801	0.6	3.5	3.0
Russia	3,823,996	26,138	3.5	1.3	0.7
Serbia	95,824	13,436	-1.0	2.6	-1.8
Slovakia	153,868	28,410	1.5	1.4	2.5
Slovenia	61,557	29,867	-2.7	-1.1	3.0
Spain	1,549,267	33,350	-2.6	-1.7	1.4
Sweden	450,283	46,195	-0.3	1.2	2.3
Switzerland	473,513	58,171	1.1	1.8	1.9
Tajikistan	22,402	2,698	7.5	7.4	6.7
Turkey	1,514,859	19,698	2.1	4.2	2.9
Turkmenistan	82,367	15,502	11.1	10.2	10.3
Ukraine	372,920	8,242	0.2	0.0	-6.6
United Kingdom	2,594,419	40,163	1.2	2.2	2.9
Uzbekistan	172,298	5,630	8.2	8.0	8.1
Total	26,545,911	29,431 [3]	1.1 [4]	1.5 [4]	1.5 [4]
World total	109,142,513	15,034 [3]	3.5	3.3	3.4

[1] Source: International Monetary Fund, World Economic Outlook Database, April 2016.

[2] Gross domestic product (GDP) listed may differ from that reported in individual country chapters owing to differences in source or date of reporting.

[3] Equals gross domestic product divided by population.

[4] Equals annual change in regional gross domestic product.

TABLE 3

SELECTED NOTEWORTHY EXPLORATION ACTIVITY IN EUROPE AND CENTRAL EURASIA IN 2014

Country	Type[1]	Site	Commodity[2]	Company	Resource notes[3]
Kazakhstan	P	Sekisovskoye	Au, Ag	GoldBridges Global Resources, plc.	2.3 Moz Au, 3 Moz Ag (R).
Turkey	E	TV Tower	Au, Ag, Cu	Pilot Gold Inc.	455,000 oz Au, 36,000 t Cu, 17 Moz Ag (D).

[1] E—Active exploration; P—Exploration associated with producing site.

[2] Abbreviations used for commodities in this table include the following: Ag—silver; Au—gold; Cu—copper. Abbreviations used for units of measure in this table include the following: Moz, million ounces; oz, ounce; t, metric ton.

[3] Based on 2014 data reported from various sources. R—proven + probable; D—demonstrated (measured + indicated). Resource data have not been verified by the U.S. Geological Survey.

TABLE 4

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals								
	Aluminum				Antimony, mine output, Sb content (metric tons)	Chromite, mine output, gross weight	Copper		
			Metal				Mine output, Cu content	Metal, refined	
Country	Alumina	Bauxite	Primary[3]	Secondary				Primary[3]	Secondary
Albania	–	–	–	–	–	652	4 e	–	–
Armenia	–	–	–	–	–	–	41	–	–
Austria	–	–	–	417	–	–	–	–	83
Azerbaijan	–	–	50	–	–	–	1	–	–
Belarus	–	–	–	–	–	–	–	–	–
Belgium	–	–	–	–	–	–	–	385 e	–
Bosnia and Herzegovina	171	605	126	–	–	–	–	–	–
Bulgaria	–	–	–	–	–	–	72	233	–
Croatia	–	–	–	–	–	–	–	–	–
Cyprus	–	–	–	–	–	–	–	3	–
Czech Republic	–	–	–	45 e	–	–	–	–	–
Denmark-Greenland	–	–	–	26	–	–	–	–	–
Estonia	–	–	–	–	–	–	–	–	–
Finland	–	–	–	21	–	1,035	43	168	–
France	300 e	–	360	180	–	–	–	–	–
Georgia	–	–	–	–	–	–	5 e	–	–
Germany	1,000 e	–	531	599	–	–	–	392	285
Greece	813	1,873	173	–	–	–	–	–	–
Hungary	61	8	–	47	–	–	–	–	–
Iceland	–	–	800 e	–	–	–	–	–	–
Ireland	1,951	–	–	–	–	–	–	–	–
Italy	–	–	–	1,000 e	–	–	–	8 e	–
Kazakhstan	1,419	4,516	208	–	481	3,810	460	294	–
Kosovo	–	–	–	–	–	–	–	–	–
Kyrgyzstan	–	–	–	–	–	–	NA	–	–
Latvia	–	–	–	–	–	–	–	–	–
Lithuania	–	–	–	–	–	–	–	–	–
Luxembourg	–	–	–	–	–	–	–	–	–
Macedonia	–	–	–	–	–	–	8 e	2	–
Malta	–	–	–	–	–	–	–	–	–
Moldova	–	–	–	–	–	–	–	–	–
Montenegro	–	155	44 e	–	–	–	–	–	–
Netherlands	–	–	–	–	–	–	–	–	–
Norway[e]	–	–	1,250	250	–	–	–	39	–
Poland	–	–	–	15	–	–	422	577	–
Portugal	–	–	–	NA	–	–	75	–	–
Romania	363	–	263 e	15	–	–	7 e	–	–

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals								
	Aluminum				Antimony, mine output, Sb content (metric tons)	Chromite, mine output, gross weight	Copper		
			Metal				Mine output, Cu content	Metal, refined	
Country	Alumina	Bauxite	Primary[3]	Secondary				Primary[3]	Secondary
Russia	2,600	5,500	3,300 e	–	9,000 e	360	860 e	667	225
Serbia[e]	–	–	–	–	–	–	36	32	2
Slovakia	–	–	168	–	–	–	–	–	–
Slovenia	–	–	85	18 e	–	–	–	–	–
Spain[e]	1,400	–	230	–	–	–	106	274	73
Sweden	–	–	113	30 e	–	–	80	177	40 e
Switzerland	–	–	–	(4) e	–	–	–	–	–
Tajikistan	–	–	121	–	8,000	–	2	–	–
Turkey[e]	144	1,091 5	54	–	2,800 3	2,900 3	97	91	–
Turkmenistan	–	–	–	–	–	–	–	–	–
Ukraine	1,457	–	–	–	–	–	–	–	12 e
United Kingdom	–	–	42	149 e	–	–	–	–	–
Uzbekistan	–	–	–	NA	–	–	100	99 e	–
Total, Europe and Central Eurasia	11,700	13,700	8,000	2,800	20,000	8,800	2,400	3,400	720
Share of world total	11.3%	5.3%	16.7%	39.2%	12.4%	30.3%	12.1%	19.5%	19.9%
United States	4,390	NA	1,710	–	–	–	1,360	1,050	46
Share of world total	4.2%	NA	3.6%	–	–	–	6.8%	6.0%	1.3%
World total	104,000	259,000	47,800	7,150	161,000	29,000	20,000	17,400	3,620

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals—Continued								
	Gold, mine output Au content (kilograms)	Iron and steel			Lead (metric tons)			Manganese, mine output, Mn content	Mercury, mine output, Hg content (metric tons)
		Iron ore, mine output, Fe content	Pig iron and direct-reduced iron	Steel, crude	Mine output, Pb content	Metal, refined			
Country						Primary[3]	Secondary		
Albania	–	–	–	310 [e]	–	–	–	–	–
Armenia	3,994	–	–	–	–	–	–	–	–
Austria	–	780	6,015	7,876	–	–	37,122	–	–
Azerbaijan	1,873	44 [e]	–	288	–	–	–	–	–
Belarus	–	–	–	2,597	–	–	–	–	–
Belgium	–	–	4,335	7,345	–	–	132,000 [e]	–	–
Bosnia and Herzegovina	–	901 [e]	860	792	4,200 [e]	–	1,200 [e]	–	–
Bulgaria	7,000 [e]	–	–	612	15,461	93,394	–	13 [e]	–
Croatia	–	–	–	167 [e]	–	–	–	–	–
Cyprus	–	–	–	–	–	–	–	–	–
Czech Republic	–	–	4,152	5,360	–	–	30,000 [e]	–	–
Denmark-Greenland	–	–	–	–	–	–	–	–	–
Estonia	–	–	–	–	–	–	8,588	–	–
Finland	9,385	–	2	3,807	–	–	–	–	–
France	–	–	10,866	16,143	–	–	72,000 [e]	–	–
Georgia	2,600 [e]	–	–	–	NA	–	–	110 [e]	–
Germany	–	48	28,503	42,941	–	160,000	248,000	–	–
Greece[e]	–	590	–	1,000	18,481 [5]	–	–	–	–
Hungary	–	–	801	1,152	–	–	–	13	–
Iceland	–	–	–	–	–	–	–	–	–
Ireland	–	–	–	–	41,000	–	17,000 [e]	–	–
Italy	–	–	6,371	23,714	–	50,000	160,000	–	–
Kazakhstan	49,207	14,900 [e]	3,189	3,693	37,800	125,289	–	390 [e]	–
Kosovo	–	–	–	150	15,300	–	–	–	–
Kyrgyzstan	18,000	–	–	–	–	–	–	–	NA
Latvia	–	–	–	–	–	–	–	–	–
Lithuania	–	–	–	–	–	–	–	–	–
Luxembourg	–	–	–	2,200 [e]	–	–	–	–	–
Macedonia	NA	–	–	196	33,154	–	–	–	–
Malta	–	–	–	–	–	–	–	–	–
Moldova	–	–	–	344	–	–	–	–	–
Montenegro	–	–	–	30 [e]	–	–	–	–	–
Netherlands	–	–	5,868	6,964	–	–	27,000 [e]	–	–
Norway	–	3,854	–	595	–	–	–	–	25 [e]
Poland	2,574	–	4,637	8,559	77,000	36,000	112,000	–	–
Portugal	–	NA	NA	2,070	–	–	5,000 [e]	–	–
Romania	–	–	1,631	3,158	–	–	12,000 [e]	–	–

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals—Continued								
	Gold, mine output Au content (kilograms)	Iron and steel			Lead (metric tons)			Manganese, mine output, Mn content	Mercury, mine output, Hg content (metric tons)
		Iron ore, mine output, Fe content	Pig iron and direct-reduced iron	Steel, crude	Mine output, Pb content	Metal, refined			
Country						Primary[3]	Secondary		
Russia	246,900	60,200 [e]	56,772	70,500	225,000 [e]	90,000 [e]	–	–	NA
Serbia	–	–	552	583	7,000	15,000	–	–	–
Slovakia	582	–	3,838	4,705	–	–	–	–	–
Slovenia	–	–	–	615	–	–	12,000 [e]	–	–
Spain[e]	1,800	–	3,958 [5]	14,249 [5]	7,000	–	166,000	–	–
Sweden	6,849	16,000 [e]	3,078	4,539	70,848	69,000 [e]	45,000 [e]	–	–
Switzerland	–	–	–	1,475	–	–	–	–	–
Tajikistan	3,477	–	–	–	24,000	–	–	–	35
Turkey	31,300	3,700 [e]	9,364	34,035	98,000 [e]	NA	–	NA	–
Turkmenistan	–	–	–	–	–	–	–	–	–
Ukraine[e]	–	37,600	24,801 [5]	27,373 [5]	–	–	13,000	519	–
United Kingdom	–	–	9,705	12,120	(4)	150,000 [e]	155,000 [e]	–	–
Uzbekistan	100,000 [e]	–	–	731	NA	–	–	NA	–
Total, Europe and Central Eurasia	486,000	139,000	189,000	313,000	674,000	789,000	1,250,000	1,000	60
Share of world total	14.9%	8.8%	15.4%	17.9%	11.4%	16.1%	22.9%	5.6%	2.6%
United States	210,000	35,500	29,400	88,200	379,000	–	1,127,000	–	–
Share of world total	6.4%	2.2%	2.4%	5.0%	6.4%	–	20.6%	–	–
World total	3,270,000	1,580,000	1,230,000	1,750,000	5,930,000	4,910,000	5,460,000	17,800	2,280

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals—Continued								
	Nickel		Platinum-group metals, refined, primary and secondary (kilograms)		Silver, mine output, Ag content (metric tons)	Tin (metric tons)		Titanium (metric tons)	
Country	Mine output, Ni content	Refinery products, Ni content	Palladium	Platinum		Mine output, Sn content	Metal, primary[3]	Ilmenite, TiO_2 content	Metal sponge, Ti content
Albania	5 [e]	–	–	–	–	–	–	–	–
Armenia	–	–	–	–	19	–	–	–	–
Austria	–	4 [e]	–	–	–	–	–	–	–
Azerbaijan	–	–	–	–	(4)	–	–	–	–
Belarus	–	–	–	–	–	–	–	–	–
Belgium[e]	–	–	–	–	–	–	–	–	–
Bosnia and Herzegovina	–	–	–	–	–	–	–	–	–
Bulgaria	–	–	–	–	50	–	–	–	–
Croatia	–	–	–	–	–	–	–	–	–
Cyprus[e]	–	–	–	–	–	–	–	–	–
Czech Republic	–	–	–	–	–	–	–	–	–
Denmark-Greenland[e]	–	–	–	–	–	–	–	–	–
Estonia	–	–	–	–	–	–	–	–	–
Finland	20	43	–	1,060	142	–	–	–	–
France	–	8	–	–	–	–	–	–	–
Georgia	–	–	–	–	1 [e]	–	–	–	–
Germany	–	–	–	54,000	–	–	–	–	–
Greece[e]	22	18 [5]	–	–	39	–	–	–	–
Hungary	–	–	–	–	–	–	–	–	–
Iceland	–	–	–	–	–	–	–	–	–
Ireland	–	–	–	–	6 [e]	–	–	–	–
Italy	–	–	–	–	–	–	–	–	–
Kazakhstan	–	–	–	–	982	–	–	20,000 [e]	13,000 [e]
Kosovo	7	–	–	–	–	–	–	–	–
Kyrgyzstan	–	–	–	–	NA	NA	–	–	–
Latvia[e]	–	–	–	–	–	–	–	–	–
Lithuania	–	–	–	–	–	–	–	–	–
Luxembourg	–	–	–	–	–	–	–	–	–
Macedonia	–	18	–	–	–	–	–	–	–
Malta	–	–	–	–	–	–	–	–	–
Moldova	–	–	–	–	–	–	–	–	–
Montenegro	–	–	–	–	–	–	–	–	–
Netherlands[e]	–	–	–	–	–	–	–	–	–
Norway	(4) [e]	92	–	–	–	–	–	400,000	–
Poland	NA	–	NA	NA	1,384	–	–	–	–
Portugal	–	–	–	–	39	75	–	–	–
Romania	–	–	–	–	–	–	–	–	–

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1,2]

(Thousand metric tons unless otherwise specified)

	Metals—Continued								
	Nickel		Platinum-group metals, refined, primary and secondary (kilograms)		Silver, mine output, Ag content (metric tons)	Tin (metric tons)		Titanium (metric tons)	
Country	Mine output, Ni content	Refinery products, Ni content	Palladium	Platinum		Mine output, Sn content	Metal, primary[3]	Ilmenite, TiO_2 content	Metal sponge, Ti content
Russia[e]	252	243 [5]	82,700 [5]	23,500	2,100	300	–	–	47,000
Serbia	–	–	23	3	7	–	–	–	–
Slovakia	–	–	–	–	(4)	–	–	–	–
Slovenia	–	–	–	–	–	–	–	–	–
Spain	8	–	–	–	6 [e]	–	–	–	–
Sweden	–	–	–	–	383	–	–	–	–
Switzerland	–	–	–	–	–	–	–	–	–
Tajikistan	–	–	–	–	2	–	–	–	–
Turkey	3	–	–	–	184	–	–	–	–
Turkmenistan	–	–	–	–	–	–	–	–	–
Ukraine	NA	NA	–	–	–	–	–	200,000	7,200
United Kingdom	–	40	–	–	–	–	–	–	–
Uzbekistan	–	–	–	–	61 [e]	–	–	–	–
Total, Europe and Central Eurasia	316	467	82,700	78,600	5,400	375	–	620,000	67,200
Share of world total	16.0%	36.7%	42.8%	37.8%	18.6%	0.2%	–	13.2%	40.0%
United States	–	–	12,400	3,660	1,160	–	–	120,000	NA
Share of world total	–	–	64.5%	1.8%	4.0%	–	–	2.6%	NA
World total	1,980	1,270	19,300	208,000	29,000	260,000	342,000	4,680,000 [6]	16,800

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals—Continued			Industrial minerals					
	Tungsten, mine output, W content	Zinc (metric tons)							
Country	(metric tons)	Mine output, Zn content	Metal, primary and secondary	Ammonia, N content	Cement, hydraulic	Diamond, natural, gemstones and industrial (thousand carats)	Phosphate rock, P_2O_5 content	Potash, K_2O equivalent	Salt
Albania	–	–	–	–	1,300 [e]	–	–	–	NA
Armenia	–	9,710	–	–	427	–	–	–	30
Austria	819	–	–	NA	4,400	–	–	–	1,154
Azerbaijan	–	–	–	–	2,867	–	–	–	5
Belarus	–	–	–	1,064	5,618	–	–	6,306	2,510 [e]
Belgium	–	–	302,000	NA	6,100 [e]	–	–	–	–
Bosnia and Herzegovina	–	8,000 [e]	–	–	840	–	–	–	921
Bulgaria[e]	–	11,992 [5]	76,293 [5]	330	1,850	–	–	–	2,200
Croatia	–	–	–	376	2,445	–	–	–	33
Cyprus	–	–	–	–	1	–	–	–	–
Czech Republic	–	–	NA	175	3,691	–	–	–	–
Denmark-Greenland	–	–	–	–	1,876	–	–	–	600 [e]
Estonia	–	–	–	–	447	–	–	–	–
Finland[e]	–	44,000 [5]	302,024 [5]	78	1,400	–	330	–	–
France	–	–	171,000	2,600 [e]	18,000	–	–	–	5,809
Georgia	–	–	–	160	1,626	–	–	–	28 [e]
Germany	–	–	193,000	2,540	32,099	–	–	3,127	13,338
Greece	–	22,752	–	–	8,000 [e]	–	–	–	146
Hungary[e]	–	–	–	300	2,750	–	–	–	–
Iceland	–	–	–	–	–	–	–	–	NA
Ireland	–	283,000	–	–	2,000 [e]	–	–	–	–
Italy	–	–	138,000	570 [e]	21,400	–	–	–	1,501
Kazakhstan	–	346,600	324,754	132	7,977	–	121 [e]	–	597
Kosovo	–	9,300	–	–	630 [e]	–	–	–	–
Kyrgyzstan	NA	–	–	–	1,728	–	–	–	1 [e]
Latvia	–	–	–	–	1,200 [e]	–	–	–	–
Lithuania	–	–	–	815	903	–	–	–	–
Luxembourg	–	–	–	–	1,100 [e]	–	–	–	–
Macedonia	–	31,570	–	–	687	–	–	–	–
Malta	–	–	–	–	NA	–	–	–	2 [e]
Moldova	–	–	–	–	1,300 [e]	–	–	–	–
Montenegro	–	–	–	–	–	–	–	–	–
Netherlands	–	–	290,000	NA	2,600 [e]	–	–	–	NA
Norway[e]	–	–	165,000	300	1,700	–	–	–	–
Poland	–	56,000 [e]	164,000	2,100 [e]	15,358	–	–	–	4,217
Portugal	671	67,384	–	NA	7,500 [e]	–	–	–	70
Romania	–	–	220	85 [e]	7,850	–	–	–	2,240 [e]

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Metals—Continued			Industrial minerals					
	Tungsten, mine output, W content (metric tons)	Zinc (metric tons)							
Country		Mine output, Zn content	Metal, primary and secondary	Ammonia, N content	Cement, hydraulic	Diamond, natural, gemstones and industrial (thousand carats)	Phosphate rock, P_2O_5 content	Potash, K_2O equivalent	Salt
Russia	2,800 [e]	250,000	223,311	12,000	68,555	36,300 [e]	4,500 [e]	7,439	1,900
Serbia	--	--	--	109 [e]	1,605	--	--	--	13
Slovakia	--	--	--	480	3,319	--	--	--	--
Slovenia	--	--	--	--	1,326	--	--	--	--
Spain	500	38,000 [e]	527,000 [e]	--	14,587	--	--	711	4,300
Sweden	--	221,841	--	--	3,000 [e]	--	--	--	--
Switzerland	--	--	--	--	4,290	--	--	--	390
Tajikistan	--	39,500	--	--	1,150	--	--	--	32 [e]
Turkey	--	210,000 [e]	--	300 [e]	71,329	--	181	--	5,932
Turkmenistan[e]	--	--	--	293	2,900	--	--	--	230
Ukraine	--	--	--	2,400	8,636	--	--	--	2,498
United Kingdom	--	--	--	1,100 [e]	9,300	--	--	900	6,600
Uzbekistan[e]	83	--	62,000	1,200	7,350 [5]	--	187	110	--
Total, Europe and Central Eurasia	4,900	1,650,000	2,940,000	30,000	367,000	36,300	5,300	18,600	57,300
Share of world total	6.1%	11.6%	21.8%	23.3%	8.6%	29.5%	6.8%	44.3%	18.1%
United States	NA	832,000	180,000	9,330 [6]	77,400	--	7,110	850	45,300
Share of world total	NA	5.9%	1.3%	7.2%	1.8%	--	9.1%	2.0%	14.3%
World total	80,700	14,200,000	13,500,000	129,000	4,270,000	123,000	78,400	42,000	316,000

See footnotes at end of table.

TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

	Mineral fuels and related materials					
	Coal			Natural gas, dry (million cubic meters)	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U_3O_8 content (metric tons)
Country	Anthracite	Bituminous	Lignite			
Albania	–	–	–	–	10,029	–
Armenia	–	–	–	–	–	–
Austria	–	–	–	1,245	6,493	–
Azerbaijan	–	–	–	18,727	304,600	–
Belarus	–	–	–	222	12	–
Belgium	–	–	–	–	–	–
Bosnia and Herzegovina	–	–	11,673	–	–	–
Bulgaria[e]	–	2,000	26,000	278 [5]	170	– [5]
Croatia	–	–	–	–	4,142	–
Cyprus	–	–	–	–	–	–
Czech Republic	–	8,341	38,348	NA	1,000	193 [e]
Denmark-Greenland	–	–	–	4,800 [e]	60,225	–
Estonia	–	–	–	–	–	–
Finland	–	–	–	–	–	–
France	–	–	–	169 [e]	5,475	–
Georgia[e]	–	294	–	10 [5]	301	–
Germany	7,600	740	178,178	9,193	17,737	33 [e]
Greece	–	–	50,800	–	514	–
Hungary	–	–	9,652	1,934	3,735	–
Iceland	–	–	–	–	–	–
Ireland	–	–	–	460 [e]	–	–
Italy	–	–	–	7,140 [e]	38,690	–
Kazakhstan	–	102,378	6,894	43,177	585,986	26,915
Kosovo	–	–	7,204	–	–	–
Kyrgyzstan	–	327	1,451	34	608	1,700 [e]
Latvia	–	–	–	–	–	–
Lithuania	–	–	–	–	593 [e]	–
Luxembourg	–	–	–	–	–	–
Macedonia	–	–	6,470	–	–	–
Malta	–	–	–	–	–	–
Moldova	–	–	–	NA	NA	–
Montenegro	–	–	1,655	–	–	–
Netherlands	–	–	–	86,400	7,738	–
Norway	–	1,701	–	112,796 [7]	572,320	–
Poland	–	73,011	63,877	5,800	7,014	–
Portugal[p]	–	–	–	–	–	–
Romania[e]	–	–	23,600	11,439 [5]	29,100	90
Russia	13,500	274,500	68,900	643,000	3,735,000	3,500

See footnotes at end of table.

TABLE 4—Continued
EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2014[1, 2]

(Thousand metric tons unless otherwise specified)

Country	Mineral fuels and related materials					
	Coal			Natural gas, dry (million cubic meters)	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U_3O_8 content (metric tons)
	Anthracite	Bituminous	Lignite			
Serbia	--	126	383	--	8,153	--
Slovakia	--	--	1,885	87	95	--
Slovenia	--	--	3,108	3	3	--
Spain	2,500	1,800	--	23 ^{p}	2,336	--
Sweden	--	--	--	--	--	--
Switzerland	--	--	--	--	--	--
Tajikistan	--	878	--	3	71	--
Turkey	--	1,917	65,739	502	18,000	--
Turkmenistan	--	--	--	69,000	86,040	--
Ukraine	8,338	23,563	5,000	20,100	19,776	1,045
United Kingdom	NA	11,648 ^{8}	--	50,000 ^{e}	310,250	--
Uzbekistan	--	20	4,377	55,000	21,200 ^{e}	3,979
Total, Europe and Central Eurasia	31,900	503,000	575,000	1,140,000	5,860,000	37,500
Share of world total	4.3%	7.8%	53.8%	23.9%	18.0%	58.1%
United States	2,400	1,010,000	86,400	888,000	3,160,000	2,260
Share of world total	0.3%	15.7%	8.1%	18.6%	9.7%	3.5%
World total	750,000	6,450,000	1,070,000	4,770,000	32,600,000	64,000

[e] Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits; may not add to totals shown. [p] Preliminary. NA Not available. -- Zero or zero percent.

[1] Some of the individual entries in this table may differ from those that appear in individual country production tables elsewhere in this volume owing to the inclusion in this table of data received at a later date.

[2] Totals may not add due to independent rounding. Includes data available as of September 28, 2016.

[3] Primary production also includes undifferentiated (primary and secondary) production for some countries listed.

[4] Less than ½ unit.

[5] Reported figure.

[6] Synthetic anhydrous ammonia; excludes coke oven byproduct ammonia.

[7] Reported as total methane sales.

[8] Also contains a mininum amount of anthracite.

TABLE 5
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Bosnia and Herzegovina	1,032	844	657	605	600	500	500
Greece	2,441	1,994	1,844	1,872	1,900	2,000	2,000
Hungary	535	171	52	8	--	--	--
Italy	300	--	--	--	--	--	--
Kazakhstan	4,815	5,310	5,192	4,516	4,700	4,800	4,900
Montenegro	672	61	61	155	310	320	320
Russia	5,000	5,688	5,617	5,500	5,500	5,500	5,500
Turkey	475	1,311	796	1,091	1,200	1,300	1,400
Total	15,300	15,400	14,200	13,700	14,200	14,400	14,600

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 6
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRIMARY AND SECONDARY ALUMINUM METAL PRODUCTION, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Austria	150	375	387	417	400	400	400
Azerbaijan	32	--	53	50	50	50	50
Bosnia and Herzegovina	131	118	129	126	120	120	120
Bulgaria	5	12	--	--	--	--	--
Czech Republic	30	40	50	45	45	45	45
Denmark-Greenland	20	29	26	26	26	26	26
Finland	34	21	21	21	21	21	21
France	664	540	526	540	600	600	600
Germany	1,366	1,014	1,089	1,130	1,100	1,100	1,100
Greece	163	137	169	173	180	180	180
Hungary	82	234	62	47	40	40	40
Iceland	273	826	736	800	810	810	810
Italy	1,314	1,414	1,061	1,000	1,000	1,000	1,000
Kazakhstan	--	226	250	208	220	230	240
Macedonia	4	309	101	--	--	--	--
Montenegro	117	82	16	44	90	100	100
Netherlands	391	300	50	--	150	165	165
Norway	1,376	1,598	1,405	1,500	1,500	1,500	1,500
Poland	66	16	16	15	15	15	15
Portugal	18	--	--	--	--	--	--
Romania	246	258	265	278	300	300	300
Russia	3,647	3,947	3,601	3,300	3,400	3,500	3,500
Serbia	(2)	2	--	--	--	--	--
Slovakia	162	190	163	168	165	165	165
Slovenia	139	59	103	103	100	100	100
Spain	637	340	235	230	230	230	230
Sweden	133	123	161	143	150	150	150
Switzerland	238	130	130	140	140	140	140
Tajikistan	380	349	216	121	134	137	141
Turkey	60	60	42	54	80	90	95
Ukraine	244	155	25	--	--	--	--
United Kingdom	574	498	193	191	191	191	191
Uzbekistan	3	--	--	--	--	--	--
Total	12,700	13,400	11,300	10,900	11,300	11,400	11,400

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

[2] Less than 1/2 unit.

TABLE 7

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED COBALT MINE PRODUCTION, 2005–2020[1]

(Co content in metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Finland	6,158	9,413	10,798	12,551	13,000	13,000	13,000
Russia	6,300	6,200	6,350	6,300	6,300	6,300	6,300
Total	12,500	15,600	17,100	18,900	19,300	19,300	19,300

[e] Estimated.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 8

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 2005–2020[1]

(Cu content in thousand metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Albania	2	4	7	4	4	5	6
Armenia	19	31	49	41	45	45	45
Azerbaijan	--	(2)	(2)	1	1	1	1
Bulgaria	112	81	75	72	75	75	75
Finland	16	15	39	43	43	43	43
Georgia	10	7	5	5	5	5	5
Kazakhstan	402	381	440	460	460	460	460
Macedonia	22	8	9	8	7	23	23
Poland	575	481	482	473	475	475	475
Portugal	90	74	77	75	75	75	75
Romania	15	5	7	7	10	10	10
Russia	700	703	870	860	900	920	940
Serbia	27	28	44	45	50	80	90
Spain	5	51	107	106	106	106	106
Sweden	98	77	83	80	83	85	85
Turkey	54	71	121	97	110	120	130
Uzbekistan	104	90	98	99	102	104	106
Total	2,250	2,110	2,510	2,480	2,550	2,630	2,680

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

[2] Less than 1/2 unit.

TABLE 9
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED REFINED COPPER METAL PRODUCTION (PRIMARY AND SECONDARY), 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2013	2014	2016^{e}	2018^{e}	2020^{e}
Armenia	10	8	11	10	10	10	10
Austria	72	113	83	83	90	90	90
Belgium	383	381	387	385	385	385	385
Bulgaria	61	215	230	233	230	230	230
Cyprus	--	3	4	3	4	4	4
Finland	125	146	144	168	170	170	170
Germany	638	704	678	677	680	680	680
Italy	32	2	5	8	8	8	8
Kazakhstan	418	323	352	294	200	200	200
Macedonia	--	--	2	2	2	4	4
Norway	39	32	37	39	40	40	40
Poland	560	547	565	577	580	580	580
Romania	21	4	--	--	--	--	--
Russia	933	874	878	892	910	930	950
Serbia	27	22	36	33	34	36	38
Slovakia	--	47	19	19	20	20	20
Spain	302	319	282	347	350	350	350
Sweden	222	191	206	217	220	220	220
Turkey	95	47	91	91	90	100	100
Uzbekistan	104	90	98	99	102	104	106
Total	4,040	4,070	4,110	4,180	4,130	4,160	4,190

^{e}Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 10
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 2005–2020[1]

(Au content in kilograms)

Country	2005	2010	2013	2014	2016^{e}	2018^{e}	2020^{e}
Armenia	1,400	1,946	3,473	3,994	4,000	4,000	4,000
Azerbaijan	--	1,900	1,619	1,873	1,900	1,900	1,900
Bulgaria	3,868	4,489	7,385	7,000	7,000	7,000	7,000
Denmark-Greenland	1,000	--	100	--	--	--	--
Finland	3,747	7,628	9,981	9,385	9,500	9,500	9,500
France	1,500	1,500	--	--	--	--	--
Georgia	1,620	5,000	4,300	2,600	3,000	3,000	3,000
Kazakhstan	17,875	30,272	42,552	49,207	65,000	70,000	75,000
Kyrgyzstan	16,751	18,072	19,000	18,000	17,000	16,000	15,000
Macedonia	400	--	--	--	--	--	--
Poland	713	776	1,066	2,574	2,500	2,500	2,500
Romania	400	400	--	--	--	--	--
Russia	164,186	189,000	231,700	246,900	255,000	265,000	275,000
Serbia	650	356	866	1,310	1,400	1,500	1,600
Slovakia	109	534	533	582	580	580	580
Spain	3,971	--	1,870	1,800	1,800	1,800	1,800
Sweden	6,600	6,242	6,530	6,849	7,000	7,000	7,000
Tajikistan	1,927	2,049	2,774	3,477	5,000	9,000	9,000
Turkey	4,170	17,000	33,500	31,300	35,000	40,000	40,000
Ukraine	180	--	--	--	--	--	--
Uzbekistan	84,210	90,000	98,000	100,000	103,000	105,000	107,000
Total	315,000	377,000	465,000	487,000	519,000	544,000	560,000

^{e}Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown. -- Zero.

TABLE 11

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED BENEFICIATED IRON ORE PRODUCTION (MINE OUTPUT), 2005–2020[1]

(Fe content in thousand metric tons)

Country	Average iron content	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Austria	32%	665	662	743	780	800	850	900
Azerbaijan	57%	4	33	68	44	60	60	60
Bosnia and Herzegovina	42%	702	588	899	901	900	900	900
Germany[2]	11%	38	41	43	48	48	48	48
Greece	38%	575	560	550	590	600	600	600
Kazakhstan	57%	11,100	13,700	14,400	14,900	14,000	14,000	14,000
Norway	62%	420	3,105	3,409	3,854	4,000	4,000	4,000
Portugal	36%	10	14	14	14	14	14	14
Romania	52%	69	--	--	--	--	--	--
Russia	59%	56,100	56,600	60,300	60,200	60,000	60,000	60,000
Slovakia	34%	182	--	--	--	--	--	--
Sweden	60%	15,300	16,750	16,162	16,000	16,000	16,000	16,000
Turkey	53%	2,450	3,000	4,500	3,700	5,000	6,000	6,000
Ukraine	55%	37,700	43,000	38,700	37,600	37,000	37,000	37,000
United Kingdom	54%	(3)	--	--	--	--	--	--
Total	XX	125,000	138,000	140,000	139,000	138,000	139,000	140,000

[e] Estimated. XX Not applicable. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

[2] Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to use in the steel industry.

[3] Less than 1/2 unit.

TABLE 12

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 2005–2020[1]

(Thousand metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Albania	87	390	312	310	400	450	500
Austria	7,031	6,569	7,953	7,876	8,000	8,200	8,400
Azerbaijan	286	129	223	288	300	300	300
Belarus	2,076	2,672	2,395	2,597	2,600	2,800	3,000
Belgium	8,906	7,973	7,092	7,345	7,300	7,300	7,300
Bosnia and Herzegovina	289	591	722	792	800	800	800
Bulgaria	1,969	737	523	612	600	600	600
Croatia	74	95	135	167	167	167	167
Czech Republic	6,189	5,180	5,171	5,360	5,400	5,400	5,400
Finland	4,738	4,023	3,517	3,807	3,800	3,800	3,800
France	19,481	15,414	15,685	16,143	16,000	16,000	16,000
Germany	44,524	43,830	42,645	42,941	43,000	43,000	43,000
Greece	2,266	1,821	1,030	1,022	1,000	1,100	1,200
Hungary	1,958	1,678	883	1,152	1,200	1,300	1,300
Italy	29,061	25,750	24,058	23,714	24,000	24,000	24,000
Kazakhstan	4,477	3,338	3,477	3,693	3,800	3,800	3,800
Latvia	550	825	712	--	--	--	--
Luxembourg	2,194	2,563	2,100	2,200	2,200	2,200	2,200
Macedonia	326	314	146	196	178	161	150
Moldova	1,016	242	190	344	350	350	350
Montenegro	104	48	20	30	100	200	200
Netherlands	6,919	6,651	6,714	6,964	7,000	7,000	7,000
Norway	701	514	605	595	600	600	600
Poland	8,336	7,996	7,950	8,559	8,600	8,600	8,600
Portugal	1,400	1,543	2,050	2,070	2,000	2,000	2,000
Romania	6,280	3,724	2,985	3,158	3,300	3,500	3,700
Russia	66,186	66,844	68,862	70,500	71,000	71,000	71,000
Serbia	1,286	1,254	396	583	883	930	980
Slovakia	4,242	4,580	4,511	4,705	4,700	4,700	4,700
Slovenia	583	606	618	615	610	610	610
Spain	17,800	16,343	13,740	14,249	15,000	15,000	15,000
Sweden	5,692	4,844	4,404	4,539	4,500	4,500	4,500
Switzerland	1,158	1,320	1,530	1,475	1,500	1,500	1,500
Turkey	20,960	29,143	34,654	34,035	35,000	40,000	40,000
Ukraine	38,541	33,559	33,199	27,373	25,000	25,000	25,000
United Kingdom	13,210	9,709	11,858	12,120	11,000	11,000	11,000
Uzbekistan	607	731	746	731	730	730	730
Total	332,000	314,000	314,000	313,000	313,000	319,000	319,000

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 13

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED NICKEL MINE PRODUCTION, 2005–2020[1]

(Ni content in metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Albania	NA	3	2	5	6	6	6
Finland	3,386	12,100	19,300	19,700	20,000	20,000	20,000
Greece	23,210	13,960	16,890	18,481	19,000	19,000	19,000
Kazakhstan	193	500	--	--	--	--	--
Kosovo	--	9,100	7,600	6,700	9,000	12,000	12,000
Norway	100	351	350	350	350	350	350
Russia	277,177	269,277	250,000	252,000	250,000	248,000	246,000
Spain	5,386	5,402	7,574	7,600	7,600	7,600	7,600
Turkey	1,000	1,900	1,100	3,000	13,000	15,500	29,000
Ukraine	6,000	--	--	--	--	--	--
Total	316,000	313,000	303,000	308,000	319,000	322,000	334,000

[e] Estimated. NA Not available. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 14

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 2005–2020[1]

(Pd content in kilograms)

Country[2]	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Poland	10	15	15	15	15	15	15
Russia	97,400	84,700	80,200	82,700	81,000	79,000	77,000
Serbia	19	22	25	23	24	25	26
Total	97,400	84,700	80,200	82,700	81,000	79,000	77,000

[e] Estimated.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

[2] Palladium production for Finland and Norway has not been estimated.

TABLE 15

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 2005–2020[1]

(Pt content in kilograms)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Finland	678	718	946	1,060	1,000	1,000	1,000
Poland	20	25	25	25	25	25	25
Russia	29,000	25,700	25,200	23,500	23,000	23,000	23,000
Serbia	3	--	--	--	--	--	--
Total	29,700	26,400	26,200	24,600	24,000	24,000	24,000

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 16
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED OF TIN MINE PRODUCTION, 2005–2020[1]

(Sn content in metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Portugal	243	22	84	75	80	80	80
Russia	3,000	144	156	300	500	1,000	1,500
Total	3,240	166	240	375	580	1,080	1,580

[e] Estimated.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 17
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED TIN METAL PRODUCTION (PRIMARY AND SECONDARY), 2005–2020[1]

(Metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
France	1,500	1,500	--	--	--	--	--
Russia	5,500	1,381	--	--	--	--	--
Total	7,000	2,880	--	--	--	--	--

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 18
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED DIAMOND PRODUCTION, 2005–2020[1]

(Thousand carats)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Russia:							
Gem grade	23,000	17,800	20,000	19,200	19,000	19,000	19,000
Industrial grade	15,000	15,000	16,000	17,100	17,000	17,000	17,000
Total	38,000	32,800	36,000	36,300	36,000	36,000	36,000

[e] Estimated.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

TABLE 19
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED LITHIUM PRODUCTION, 2005–2020[1]

(Li minerals in metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Portugal	26,185	40,110	19,940	17,459	18,000	18,000	18,000

[e] Estimated.

[1] Estimated data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 20

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 2005–2020[1, 2]

(Thousand metric tons)

Country	2005	2010	2013	2014	2016[e]	2018[e]	2020[e]
Albania	3	3	--	--	--	--	--
Austria	14	--	--	--	--	--	--
Bosnia and Herzegovina	9,144	10,976	11,765	11,673	12,000	13,000	13,000
Bulgaria	24,909	30,200	28,500	28,000	28,000	28,000	28,000
Czech Republic	61,903	55,124	49,195	46,689	45,000	45,000	45,000
Georgia	5	241	372	294	300	300	300
Germany	202,621	182,303	190,956	186,518	180,000	--	--
Greece	73,585	53,600	55,500	50,800	50,000	45,000	45,000
Hungary	9,580	9,113	9,581	9,652	9,700	10,000	10,000
Kazakhstan	86,586	106,568	114,384	109,272	110,000	110,000	110,000
Kosovo	6,391	7,958	8,219	7,204	7,200	7,400	7,600
Kyrgyzstan	396	575	1,425	1,777	1,800	1,900	2,000
Macedonia	6,949	6,583	6,633	6,470	8,000	10,000	12,000
Montenegro	1,297	1,938	1,693	1,655	1,600	1,640	1,680
Norway	300	1,685	1,855	1,701	1,700	1,700	1,700
Poland	159,039	133,238	142,624	136,888	130,000	130,000	120,000
Romania	34,201	30,000	24,723	23,556	26,000	27,500	28,500
Russia	282,881	321,600	351,700	356,900	370,000	375,000	380,000
Serbia	34,993	339,000	160	126	133	135	142
Slovakia	2,511	2,378	2,009	1,885	1,900	1,900	1,900
Slovenia	4,539	4,430	3,721	3,108	3,100	3,100	3,100
Spain	19,350	8,430	4,370	4,300	4,000	4,000	4,000
Tajikistan	99	200	516	878	922	968	1,000
Turkey	58,676	84,648	66,113	67,656	80,000	90,000	100,000
Ukraine	74,559	54,444	63,600	45,230	45,000	45,000	45,000
United Kingdom	20,498	18,159	12,767	11,648	5,700	5,700	5,700
Uzbekistan	3,003	3,300	4,090	4,397	4,400	4,400	4,400
Total	1,180,000	1,470,000	1,160,000	1,120,000	1,130,000	962,000	970,000

[e] Estimated. -- Zero.

[1] Estimated data and totals are rounded to no more than three significant digits; may not add to totals shown.

[2] Includes anthracite, bituminous, and run-of-mine lignite.

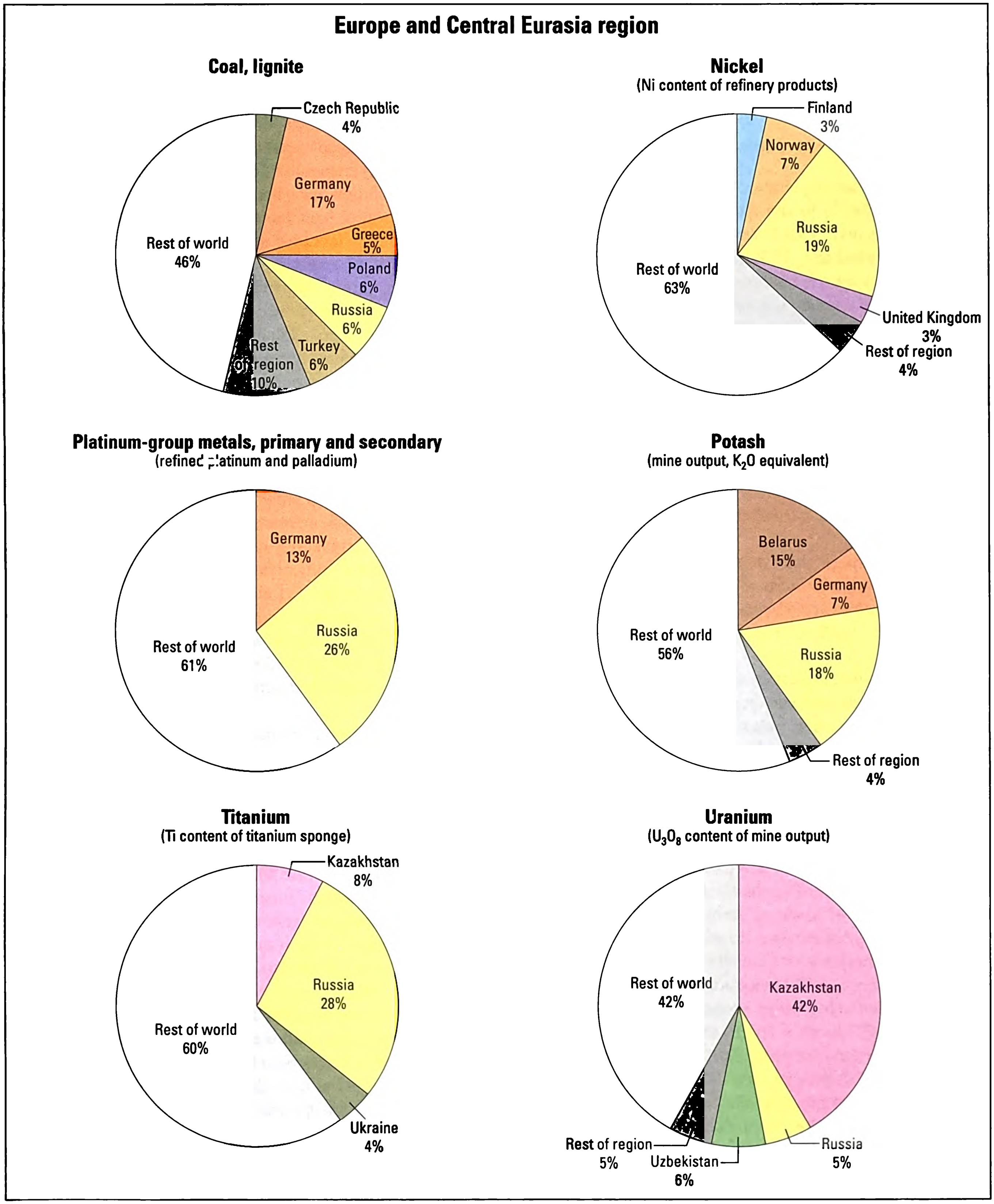

Figure 2. Pie charts showing percentage of world production of selected mineral commodities by countries of the Europe and Central Eurasia region in 2014. Individual countries of the region are labeled if they accounted for at least 3% of world production. Data are from table 4. Percentages are rounded and may not add to 100%. Also, percentages may differ from those reported in individual country chapters owing to differences in source or date of reporting.

THE MINERAL INDUSTRY OF ALBANIA

By Sinan Hastorun

Albania is a relatively small, mountainous country in the Western Balkan Peninsula that has 362 kilometers (km) of coastline on the Adriatic Sea. The country has significant extractable mineral deposits of chromium, coal, copper, iron, nickel, and petroleum, along with potential offshore hydrocarbon and hydroelectric power resources. In 2014, Albania also produced cement, clay, ferrochromium, gypsum, limestone, silica sand, and steel. The country was not a significant producer of mineral commodities on a world scale, with the exception of chromium, which accounted for about 2.5% of world production. The exploration, extraction, and processing of mineral ores constituted a substantial and growing component of Albania's economy. In 2014, mineral extraction activity continued to expand, albeit at a subdued rate, and was mainly financed by foreign direct investment. The value of the country's mineral exports decreased owing to the recession in the economies of its leading trade partners in the euro area, Italy and Greece, and the decline in the global price of crude petroleum, which reduced petroleum extraction activity in Albania in the latter half of 2014 (table 1; Ministry of Energy and Industry, 2011, p. 3; Albania Energy Association, 2012, p. 6; U.S. Agency for International Development, 2012, p. 12; Extractive Industries Transparency Initiative, 2014; European Commission, 2015a, p. 134, 135; Institute of Statistics, 2015b, p. 10; 2015c; Papp, 2016, p. 43).

In June 2014, Albania officially became a European Union (EU) candidate state after a 20-year economic and political transition to a free market democracy. Although membership negotiations with the European Commission were not yet launched, the pre-accession alignment process provided further impetus to the country's efforts to harmonize its laws, including in the mineral sector, with the EU body of law, particularly with regard to mineral concessions and hydrocarbon tenders. Although the national program of privatizing state-owned enterprises was ongoing, Albpetrol JSC (the petroleum company), and Albanian Refining and Marketing Organization (ARMO) Sh.A. (the petroleum refiner) were not fully privatized as of yearend 2014. The Government continued to offer concessions in order to increase the production and processing of chromium, copper, and nickel, and to begin production of basalt, bituminous sands, decorative stones, and olivinite. Many mining permits were cancelled following an audit of mineral exploration and extraction companies. The Government planned to issue new offshore petroleum and natural gas exploration licenses and to begin the construction of the Albanian section of the Trans-Adriatic Natural Gas Pipeline in 2015 (European Bank for Reconstruction and Development, 2014; Invest in Albania, 2014d, e; Likmeta, 2014; European Commission, 2015b; U.S. Department of State, 2015, p. 7).

Minerals in the National Economy

In 2014, Albania's gross domestic product (GDP) increased by 2.1% compared with a 1.4% rate of growth in 2013. The nominal GDP in 2014 was $13.4 billion, which was an increase from $12.9 billion in 2013. The increase in economic growth was mainly due to increased private consumption and investment. Industry grew at a real rate of 2.4% in 2014. Within industry, the gross value added by manufacturing decreased by 3.2% in 2014. The value of the extractive industries, which included mining and quarrying of both fuel and nonfuel minerals, increased by 10.7% in 2014 compared with a 12.0% increase in 2013. The slowdown in the expansion of the industrial sector reflected the decrease in petroleum extraction activity in the second half of the year (European Commission, 2015a, p. 134; Institute of Statistics, 2015a; International Monetary Fund, 2015, p. 3; World Bank, The, 2015a, p. 1; 2015b).

In 2014, industrial production made up about 15.1% of the GDP. The extractive industries accounted for 43.5% of the value of industrial production and about 6.6% of the GDP compared with 40.5% and 6.2%, respectively, in 2013 (Institute of Statistics, 2015c).

Minerals, in particular base metals, continued to be a significant source of export revenue for Albania's economy, although they decreased (by value) and as a share of total exports in 2014. Mineral products, including industrial minerals, mineral fuels, and metal ores, but not processed metals, were the leading export and import goods of the country. In 2014, exports of mineral products decreased by 14% to $756 million (85.9 billion Albanian lek[1]) and made up about 33.6% of total exports compared with 40.3% in 2013. The value of exports of base metals and articles made of base metal increased by 3% to $320 million and made up about 14.2% of total exports. In terms of individual mineral commodities, mineral fuels accounted for 25.3% of Albania's total exports; followed by iron and steel (8.3%), aluminum (1.9%), copper (1.0%), and lead (0.2%). Mineral products continued to be the leading import category and were valued at about $790 million, decreasing by 3% from 2013. They accounted for 16.3% of the total value of Albania's total imports in 2014 compared with 17.9% in 2013. The value of imports of base metals and articles made of base metals increased by 15% to $510 million and made up about 10.4% of total imports compared with 9.7% in 2013. In terms of individual minerals, mineral fuels and lubricants accounted for 15.5% of Albania's total imports; followed by iron and steel (4.6%), articles made of iron and steel (2.6%), aluminum (1.4%), and copper (0.1%) (Institute of Statistics, 2015b, p. 11, 13, 15, 23, 25, and 27).

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[1] Where necessary, values have been converted from Albanian lek (ALL) to U.S. dollars (US$) at an average exchange rate of ALL113.6=US$1.00 for 2014.

European countries continued to be Albania's main trade partners. In 2014, Italy accounted for 52.0% of Albania's exports, followed by Spain (6.5%), Turkey (3.9%), and Greece (3.5%). In terms of imports, Italy again had the largest share (29.8%), followed by Greece (9.4%), China (7.3%), Turkey (7.1%), Germany (6.0%), and Serbia (4.3%). In 2014, Albania's exports to the United States were valued at \$69.0 million. Mineral exports to the United States included, in order of value, crude petroleum, \$41.4 million; steelmaking materials, \$2.6 million; and bauxite and aluminum, \$398,000. Albania's imports from the United States were valued at \$51.3 million in 2014. Mineral imports from the United States included, in order of value, petroleum products, \$6.1 million; other chemicals, \$3.7 million; precious metals, \$394,000; finished metal shapes, \$225,000; and iron and steel products, \$14,000 (Institute of Statistics, 2015b, p. 17, 30; U.S. Census Bureau, 2015a, b).

Government Policies and Programs

The mineral industry in Albania is regulated by the Ministry of Energy and Industry (MEI) and the National Agency of Natural Resources (AKBN). The main responsibilities of the MEI are drafting mineral policies and legislation, organizing competitive tenders and selecting winning bids, and issuing mineral exploration and extraction permits. The AKBN negotiates mining agreements with companies and supervises compliance with mining laws and permit requirements during extraction and post-mining phases. Requests for new permits or changes to existing permits are filed with the National Licensing Center (NLC), which delivers the relevant permit once it is approved by the MEI (National Agency of Natural Resources, 2012b, p. 2; Jani and Qirushi, 2014, p. 8; Uruçi and Limaj 2014, p. 9).

The Mining Sector Law of 2010 (law No. 10,304/2010) is the principal law governing all mineral extraction activities in Albania. This law classifies minerals into the following four categories: (1) metallic minerals, nonmetallic minerals, and coal and bitumen; (2) construction minerals; (3) precious stones and semiprecious stones; and (4) radioactive minerals. The Licensing Law of 2009 (law No. 10081) defines the procedure and terms for obtaining a mineral permit. Petroleum activity in Albania is governed by law No. 7746 of 1993 ("On Petroleum Exploration and Production"), amended by law Nos. 7811 and 7853 of 1994 and 9975 of 2008 (National Agency of Natural Resources, 2012a, p. 11; Deloitte Audit Albania sh.p.k, 2014, p. 13; Uruçi and Limaj, 2014, p 9).

An exploration permit is generally valid for a period of 3 years, which may be extended only once for 1 year. An extraction permit may be issued for up to 25 years, with the possibility of a 10-year extension. The Law on National Taxes of 2008 (Law No. 9975) sets tax as a percentage of a mineral's sale price in the range of 4% to 10%. Starting in January 2014, companies are also required to pay a 15% net profit tax, with the exception of petroleum companies, which must pay a tax of 50% on profits as well as a royalty of 10% (National Agency of Natural Resources, 2012a, p. 11; Deloitte Audit Albania sh.p.k, 2014, p. 30, 31, 46; Uruçi and Limaj, 2014, p. 10, 11).

The Minister of Energy and Industry may negotiate the extension of a concession agreement under law No. 134/2014 of July 2014 and the Official Bulletin No. 165 of August 2014. The subcontracting clause of the new law allows mining permit holders to subcontract their right for exploration and extraction with the approval of the MEI (European Bank for Reconstruction and Development, 2015, p. 3, 4).

Production

The production of most minerals in Albania increased in 2014, with some more than doubling on an annual basis, while a few minerals showed substantial decreases. Among metals, the production of nickel ore increased by 130%, and nickel, by an estimated 150%; chromium concentrate, by an estimated 57%; ferrochromium, by 41%; and chromite (marketable ore), by 25%. The production of copper ore and copper both decreased by 49%. Among industrial minerals, silica sand output increased by 321%; limestone, by 79%; clay, by 37%; and gypsum, by 13%. Among mineral fuels and related materials, refined fuels output increased by 733%, and crude petroleum, by 14%. Bitumen production decreased by 26%. Natural gas was not produced in 2014, and coal and coke output remained at zero (table 1).

Structure of the Mineral Industry

The largest private companies in Albania's mineral industry were AlbChrome Ltd. (chromium), Antea Cement Sh.A. (cement), Bankers Petroleum Ltd. (crude petroleum), Beralb Sh.A. (copper), Kürüm International Sh.A. (lime and steel), and TransAtlantic Petroleum Ltd. (crude petroleum). All major producers were foreign owned, by Austrian, Canadian, Italian, Turkish-Chinese, and Turkish companies. In November 2014, Stream Oil and Gas Ltd., which was one of the three major petroleum producers in the country, was acquired by TransAtlantic Petroleum of Canada. Table 2 lists major mineral industry facilities and their ownership (table 2; TransAtlantic Petroleum Ltd., 2015b).

Albpetrol was wholly owned by the Government after the company's acquisition by Vetro Energy Pte. Ltd. of Singapore was invalidated in February 2013. The Government planned to privatize Albpetrol and to sell its 15% share in ARMO in 2015, but no details on a timetable or procedure were yet available (Koleka, 2013; Popp and Loloci, 2014, p. 28).

In March 2014, the MEI revoked the operating licenses of 121 mining companies owing to a lack of compliance with mining laws, which accounted for about 16% of the total licenses issued in the country. According to the Ministry's review of all previously issued licenses, some companies did not make their warranty payments for environmental rehabilitation, while others mined illegally in protected areas or with expired mining licenses. In September, the MEI announced that it had canceled 170 mining permits and 40 hydroelectric powerplant licenses because of the operators' failure to meet contractual obligations on invested funds and operational standards or their failure to pay fines as required for mining violations. The audit was a precursor to planned changes to mining legislation on environmental rehabilitation. Following the review, about 800 licensed businesses were operating in the mineral industry in Albania; about 900 businesses were closed in 2014. In October, the Assembly approved amendments to the mining law, which required permit holders to rehabilitate mining sites periodically and to ensure mine safety (Invest in Albania, 2014e, f; Likmeta, 2014; Xinhua, 2014).

Commodity Review

Metals

Chromium.—Between 58% to 70% of chromium output in Albania was estimated to have been extracted from the District of Bulqiza. Chromium reserves in the country were estimated at 36.9 million metric tons (Mt), of which about 12.8 Mt were 30% to 42% Cr_2O_3 (Albanian Investment Development Agency, 2013, p. 17; Deloitte Audit Albania sh.p.k, 2014, p. 5).

In June 2014, AlbChrome began development to increase the depth of shaft number 9 in Bulqiza as part of a 20-month project to extend the life of the mine. The $20 million investment in Bulqiza was considered to be one of the largest mining investments in Europe recently. The planned depth of shaft number 9 was 600 meters (m), starting at 420 m above sea level and ending at 180 m below sea level. Once realized, the project would enable further expansion of the Bulqiza Mine to drill 250 m below sea level and to access 1.165 Mt of chromium ore at a grade of 41.52% Cr_2O_3. The average annual output was expected to increase to 80,000 metric tons (t) as a result of the new investment (Invest in Albania, 2014a; Mining Weekly, 2014).

Columbus Copper Corp. of Canada held chromite exploration licenses for two properties. In July 2014, Columbus Copper reported that it was awaiting the issuance of chromite mining permits for the 5.77-square-kilometer (km^2) Bulqiza-Batra property and the 1.013-km^2 Qafe Burreli property after the MEI completed its review of previously issued permits that overlapped with the company's properties. All other necessary approvals, including an environmental permit, were received. Previous exploration work by Columbus Copper revealed significant potential for near-term chromite production (Columbus Copper Corp., 2014).

Copper.—Extractable copper reserves were estimated to be about 27 Mt of ore at an average grade of 1.52% in about 50 deposits across Albania. The Mirdita and Puka regions contained the country's identified copper deposits with the highest grade (Ministry of Energy and Industry, 2011, p. 8; National Agency of Natural Resources, 2012b, p. 14; Beralb Sh. A., 2015b).

Beralb, which was a subsidiary of Ekin Maden Ticaret ve Sanayi A.Ş. of Turkey, was the only industrial company extracting and processing copper in Albania. The company's Fushe-Arrëz flotation plant, which treated copper ores from the Munella and The Lak Roshi Mines in the Province of Puka with grades of 0.9% to 2.0% Cu, was the only operating beneficiation plant in the country. Plant recovery was in the range of 84% to 86% to produce copper concentrate grading at 18% to 20% Cu. In 2014, Berabl obtained 25-year exploitation permits for four additional copper mines: Paluca (surface mining permit for 3.18 km^2), Tuç (0.88 km^2), Qaf Bari (0.78 km^2), and Fushe-Arrëz (0.55 km^2). These mines were under development as of yearend 2014, and production was planned to begin by 2016. In May 2014, Ekin Maden announced that it had entered into a strategic partnership with Jiangxi Copper Company Ltd. of China, which acquired a 50% stake in Beralb for $65 million (Bhal, 2014; Beralb Sh. A., 2015a–e).

Gold.—Tirex Resources Ltd. of Canada held a precious metal exploitation license for the 553-km^2 Mirdita Project in northern Albania. Drilling conducted through 2014 showed volcanogenic massive sulfide (VMS) mineralization in four separate zones within the project area. Tirex Resources reported that its drill holes had intersected 0.6% copper, 9.0% zinc, 48.4 grams per metric ton (g/t) silver, and 2.7 g/t gold in a 65-m-long core in Koshaj; 3.5% copper, 0.6% zinc, 7.5 g/t silver, and 1.3 g/t gold in a 13.85-m-long core, and 5.9% copper, 37.5 g/t silver, and 3.4 g/t gold in a 7.1-m-long core in South Gurthi No. 2; and 2.18% copper, 3.80% zinc, 38.0 g/t silver, and 4.0 g/t gold in a 11.1-m-long core in Letitna (Tirex Resources, 2015a, b).

Arian Resources Corp. of Canada held exploration licenses for the Kacinar gold and the Perlat copper-gold-silver properties as a result of the company's acquisition of Balkan Resources Sh.p.k. in May. In June 2014, the company received a 2,305-hectare exploration permit from the NLC for the Perlat property for 3 years. In July 2014, Arian Resources reported that the first two holes drilled at the Kacinar project did not return expected gold values, and the future of the project would be decided based on results from the third hole. In October 2014, initial drill holes completed as part of a 5,000-m drill program confirmed historic drilling results of high-grade precious metal mineralization at Perlat. One of the holes intersected 2.8 m of mineralization at a depth of 191.6 m containing 5.26 g/t gold, 80.8 g/t silver, and 6.33% copper, while another hole intersected 5.8 m of mineralization at a depth of 235.4 m containing 1.47 g/t gold, 15.44 g/t silver, and 8.41% copper. In November, Arian Resources reported that it would conclude the Perlat drill program, which was begun in August, by the end of the month (Arian Resources Corp., 2014a–e; 2015a, b).

Nickel.—Nickel reserves were estimated at about 322 Mt of iron-nickel ore, of which iron-nickel was 220 Mt grading 0.8 to 1.1% nickel, and nickel silicate was 102 Mt grading 1.1 to 1.4% nickel. Iron-nickel and nickel-silicate deposits were located along the eastern border of Albania (Ministry of Energy and Industry, 2011, p. 9; Albanian Investment Development Agency, 2013, p. 17).

The production of nickel ore and nickel content increased significantly in 2014, surpassing the previous peak output in 2011. The reason for the increase in nickel production was unknown, but could be attributed to Cunico Resources NV's supply strategy for its ferronickel plant in Kavadarci, Macedonia. Cunico Resources, which was also the owner of Feni Korcha and Albanian Resources, blended Macedonian ore with higher grade ores from mines in Albania as well as imports from other countries. In April 2014, the company acquired the Mayaniquel Project in Guatemala in order to secure 30 years of high-grade nickel reserves for fully integrated ferronickel production and to further expand into emerging markets (Cunico Resources NV, 2014; Davies, 2014).

Iron and Steel.—In 2014, Kürüm International, which was a subsidiary of Kürüm Holding of Turkey and the sole steelmaker in Albania, reported production of 303,000 t of hot-rolled construction bars and 443,000 t of liquid steel (billets) at its Elbasan Steel Production Facilities, which corresponded to almost 100% target attainment for the company. The company achieved increases in capacity to 700,000 t of iron and 510,000 t of billets through the acquisition of four hydroelectric powerplants (HPP) with a combined capacity of 76.5 megawatts from the Government in 2013. The acquisition and rehabilitation of the HPP, which was partially financed by the World Bank, allowed the Elbasan facility to become self-sufficient in energy production. In 2014, Kürüm International supplied 66% of the market demand for steel in Albania. The company sold 46% of the iron that it produced domestically, and 54% was sold to neighboring countries, such as Kosovo, Macedonia, and Serbia (Kürüm Holding, 2015, p. 3, 27, 32, 33, 34, 35; World Bank, The, 2015a, p. 20).

In December 2014, the Government ordered Kürüm International to package, label, and warehouse 10,000 t to 15,000 t of heavy metal waste as hazardous waste and to cease storing it on the bank of the Shkumbin River. The sponge and plastic accumulation was excess scrap metal waste that was imported and could not be processed by the Elbasan smelter. Kürüm International had signed an agreement with the new Government in 2013 to import 600,000 t of scrap annually. The company was estimated to account for 90% of all scrap imports in Albania (Raxhimi, 2014).

Industrial Minerals

Cement.—Antea Cement, which was a subsidiary of the TITAN Group of Greece, and Seament Holding of Lebanon, each had a 40% share of the growing cement market in Albania. Estimated cement consumption in the country increased to 1.6 Mt in 2014 from 1.5 Mt in 2013, of which 20% was supplied by imports. Antea Cement operated its greenfield, integrated cement plant in Burizane, which had been constructed in 2010 with partial financing from the World Bank and the European Bank for Reconstruction and Development (TITAN Group, 2015, p. 8, 12, 32, 33; World Bank The, 2015a, p. 24).

Mineral Fuels

In 2012 (the latest year for which comprehensive data were available), Albania's primary energy supply sources were crude petroleum and petroleum products (56%), hydroelectric power (16%), and natural gas (0.6%). Domestic electricity production consisted almost entirely of hydroelectricity. Albania was dependent on energy imports for about one-half of its energy needs (Honoré, 2014, p. 76; Invest in Albania, 2014c; Popp and Loloci, 2015, p. 236).

Petroleum and Natural Gas.—Approximately 85% of Albania's total petroleum output originated from the Patos-Marinza field. With about 191 million barrels (Mbbl) of petroleum in proven and probable reserves and 5.1 billion barrels (Gbbl) of petroleum in place, Patos-Marinza was considered the largest onshore petroleum field in Europe. Albania's total onshore petroleum reserves were estimated to be 1.6 Gbbl, of which about 346 Mbbl was recoverable reserves. Offshore petroleum reserves in Albania's territorial waters in the Adriatic Sea were estimated to be 1.3 Gbbl, of which about 314 Mbbl was recoverable (Deloitte Audit Albania sh.p.k, 2014, p. 5; Invest in Albania, 2014b; Bankers Petroleum Ltd., 2015a, p. 4; 2015b, p. 2).

In 2014, total crude petroleum production in Albania, which was primarily by Bankers Petroleum and TransAtlantic Petroleum, both of Canada, increased. There was no natural gas production. Bankers Petroleum operated the Patos-Marinza and Kucova oilfields and produced 20,690 barrels per day (bbl/d) of petroleum in 2014, which was about a 14% increase from the production of 18,169 bbl/d in 2013. As of December 31, 2014, Bankers Petroleum had proven petroleum reserves in Albania of 125 Mbbl compared with 147 Mbbl as of yearend 2013 and proven and probable reserves of 203 Mbbl (232 Mbbl as of yearend 2013). In August 2014, the company started development of the Kucova oilfield in the Arreza pool by taking over 59 wells from Albpetrol, reactivating three wells, and drilling the first horizontal well. Also in August, Bankers Petroleum began delivering crude petroleum to the domestic ARMO refinery. The company held exclusive rights to explore the 158,000 acre Block F, which was adjacent to the Patos-Marinza field, for petroleum and natural gas (Bankers Petroleum Ltd., 2015b, p. 2, 4, 5; TransAtlantic Petroleum Ltd., 2015a, p. 10).

TransAtlantic Petroleum produced 842 bbl/d of petroleum in 2014, which was about a 17% decrease from 1,009 bbl/d in 2013. The company had proven reserves of 14.3 Mbbl of petroleum and 232,060 cubic meters of natural gas and probable reserves of 10 Mbbl of petroleum and 566,000 cubic meters of natural gas as of yearend 2014. In 2014, TransAtlantic Petroleum took over from Albpetrol 23 wells in the Ballshield, of which 13 were active; 70 wells in Cakran-Mollaj, of which 30 were active; and 295 wells in Gorisht-Kocul, one-half of which were active. The company owned the Delvina Concession, which was comprised of the partially developed Delvina natural gas field and the Delvina exploration. In April 2014, Stream Oil and Gas drilled the D34H1 well in the Delvina field and reached a depth of 750 m. Drilling was halted owing to a lack of investment funds. TransAtlantic Petroleum, which acquired Stream Oil and Gas in November, planned to resume drilling at the well in the first half of 2015 (TransAtlantic Petroleum Ltd., 2015a, p. 10).

Petromanas Energy Inc. of Canada held a production-sharing contract for Blocks 2 and 3 in south-central Albania with Royal Dutch Shell plc. of the United Kingdom. In March 2014, the company logged the upper carbonate thrust sheet of its Molisht-1 well, which it drilled in August 2013. In May 2014, Petromanas Energy forfeited its production-sharing contract for Blocks D and E. In June 2014, the company submitted a phased appraisal plan to the Government for additional wells in the area of its Shpirag-2 hydrocarbon discovery, which was made in 2013, and it entered the second exploration period of the contract. In October 2014, Petromanas Energy suspended drilling at the Molisht-1 well at a depth of about 4,200 m after it penetrated about 250 m of Eocene carbonate and identified hydrocarbons in drill cuttings. The company planned to drill the well to a total depth of 5.5 km with a new rig. Petromanas Energy also planned to drill a third Shpirag well in the fourth quarter of 2015 (Royal Dutch Shell plc., 2013; Petromanas Energy Inc., 2014, p. 12, 13; 2015a, p. 9, 10; 2015b, p. 6, 7).

Outlook

Albania has the potential to increase production of metals and mineral fuels as various mineral exploration projects continue to yield viable results and move into the extraction phase, and as foreign companies increase their investments in the mineral sector. Recent capacity improvements in chromium, copper, and iron and steel facilities and the drilling of new petroleum and natural gas wells are likely to result in a higher rate of output growth among these five mineral commodities in the coming years. The exploration for precious metals, such as gold and silver, is at a relatively early stage but may move into the extraction phase in the medium term by building on past drilling results. Albania's newly acquired EU-candidate status and various Government incentives provided to investors in the mineral sector are expected to provide further impetus to foreign direct investment inflows to the country. The planned privatization of Albpetrol and the auction of 13 petroleum exploration blocks in 2015 are likely to further increase hydrocarbon exploration and production in Albania. The construction of Albania's section of the Trans Adriatic Pipeline (TAP) was expected to begin in 2015. Once completed, the natural gas pipeline would increase natural gas supply in Albania and turn the country into an important hydrocarbon transit point between the Caspian region and European markets (Koleka, 2014; Popp and Loloci, 2015, p. 33; Trans Adriatic Pipeline AG, 2015).

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TABLE 1
ALBANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Chromium:						
Chromite, gross weight (18% to 42% Cr_2O_3)		328,322	330,938	380,349	521,080 [r]	652,463
Marketable ore (41.6% Cr_2O_3)		122,000 [e]	123,000 [e]	141,140	198,010	247,935
Concentrate		38,000 [e]	38,000 [e]	43,900	10,501	16,523
Copper:						
Ore, gross weight		139,926	305,284	479,720	507,105	259,137
Cu content of ore (1.36% average)[e]		2,000	4,400	7,000	6,900 [r]	3,500
Iron and steel:						
Metal, ferroalloys, ferrochromium		23,233	28,694	24,018	24,692	34,897
Steel:						
Crude		390,000 [e]	463,620	381,692	312,000 [r]	310,000 [e]
Rolled		235,882	295,333	248,327	258,000 [r]	260,000 [e]
Nickel, ore:						
Iron-nickel and nickel-silicate ores		269,300	270,000 [e]	75,017	215,086	493,867
Ni content of ores[e]		3,000	3,000	1,000	2,000	5,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	1,300	1,400 [r]	1,300 [r]	1,200 [r]	1,300 [e]
Clay, kaolin	do.	795	974	961	768 [r]	1,050
Gypsum		77,400	80,000 [e]	91,021	111,649 [r]	126,399
Lime		46,039	43,620	23,096	23,007	23,000 [e]
Limestone	cubic meters	2,363,445	2,400,000 [e]	2,727,451	1,811,378 [r]	3,232,937
Silica sand	do.	12,000 [e]	12,000 [e]	3,598 [r]	2,550 [r]	10,731
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite		2,500	1,200	--	--	--
Gas, natural, gross production	thousand cubic meters	13,000	15,000	17,500	340 [r]	--
Petroleum:						
Crude	thousand 42-gallon barrels	4,899	5,895	6,787	8,836 [r]	10,029
Refinery products:						
Bitumen		32,600	44,000	80,728	169,800	125,625
Coke[e]		16,000	62,000	15,000	-- [r]	--
Fuels	thousand 42-gallon barrels	376	560	132	335 [r]	2,789

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto. -- Zero.

[1] Table includes data available through July 10, 2015.

[2] In addition to the commodities listed, a variety of industrial minerals and construction materials (common clay, dolomite, olivinite, salt, sand and gravel, and stone) are thought to have been produced, but output is not reported quantitatively, and available information is inadequate to make reliable estimates of output. A small amount of bauxite may also have been produced.

TABLE 2
ALBANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Cement		Fushe Kruje Cement Factory, Sh.p.k. (Seament Holding)	Fushe Kruje, 20 kilometers north of Tirana	1,330
Do.		Antea Cement Sh.A. (TITAN Group)	Burizane, 35 kilometers north of Tirana	1,500
Do.		Colacem Albania Sh.p.k. (Colacem S.p.A.)	Balldre, northwestern Albania	NA
Chromium		AlbChrome Ltd. (ACR) (Balkan Finance Investment Group, 100%)	Mine in Bulqiza, 40 kilometers northeast of Tirana	100
Do.		do.	Pogradec (including Katjiel and Pojske Mines)	NA
Do.		Numerous small producers	Mostly concentrated near Bulqiza	NA
Copper:				
Mine		Beralb Sh.a. (Ekin Maden Ticaret ve Sanayi A.Ş., 50%, and Jiangxi Copper Company Ltd., 50%)	Munella Mine, 25 kilometers from Fushe-Arrez	300
Do.		do.	Lak Roshi Mine, 14 kilometers from Fushe-Arrez	200
Do.		do.	Karma 2 Mine near Shkodra in the northwest	150
Concentrate		do.	Fushe-Arrëz flotation plant	50
Ferrochromium		AlbChrome Sh.p.k. (ACR) (Balfin, 100%)	Elbasan, 32 kilometers southeast of Tirana	33
Lime		Kürüm International Sh.A. (Kürüm Holding, 100%)	do.	72
Natural gas	million cubic meters	Albpetrol Sh.a. (Government owned)	Gasfields in southwestern Albania	NA
Do.	do.	TransAtlantic Petroleum Ltd.	Delvina gasfield in southern Albania	NA [1]
Nickel		Feni Korcha & Albanian Resources (Cunico Resources NV, 100%)	Bitincka Mine near Kapstica, Guri-I-Kuq Mine near Pogradec, Nome Mine in Kukes, and Treni Mine near Korca	NA
Petroleum:				
Crude	42-gallon barrels per day	TransAtlantic Petroleum Ltd.	Ballsh-Hekal, Cakran-Mollaj, and Gorischt-Kocul oilfields in southwestern Albania	2,400
Do.	do.	Bankers Petroleum Ltd.	Oilfields at Kucova and Patos-Marinza, east of Fier in south-central Albania	27,700
Refined	do.	Albanian Refining and Marketing Organization Sh.a. (ARMO) (Anika Enterprises, 85%, and Government, 15%)	Refineries at Ballsh and Fier	30,100
Steel		Kürüm International Sh.A. (Kürüm Holding, 100%)	Electric arc furnace plant at Elbasan	700

[e] Estimated. Do., do. Ditto. NA Not available.

[1] TransAtlantic Petroleum Ltd. did not produce any natural gas in 2014.

THE MINERAL INDUSTRY OF ARMENIA

By Elena Safirova

Armenia ranked seventh in the world in mine output of molybdenum in 2014. Besides molybdenum, Armenia produced other metals, such as copper, gold, silver, and zinc, and industrial minerals and products, including cement, diatomite, gypsum, limestone, and perlite. The country also produced aluminum foil from aluminum imported from Russia, and ferromolybdenum, molybdenum metal, and rhenium salts (ammonium perrhenate and potassium perrhenate) from local ores. It also had developed a diamond-cutting industry based on imported diamond. Armenia possesses resources of copper, gold, iron ore, lead, molybdenum, and zinc. It also has resources of construction materials, such as basalt, granite, limestone, marble, and tuff; semiprecious stones, such as agate, jasper, and obsidian; and other nonmetallic minerals, such as bentonite, diatomite, perlite, and zeolites (Polyak, 2016).

In October, Armenia signed a treaty declaring that it was planning to join the Eurasian Economic Union, which was the successor of the Eurasian Customs Union. The Eurasian Customs Union was created in January 2010 as a Customs Union of Belarus, Kazakhstan, and Russia, and was the first step in a plan to establish closer economic ties among member countries. According to the treaty, Armenia would become a member of the Eurasian Economic Union in January 2015, but initially its rights would be limited compared with those of the original members (Belarus, Kazakhstan, and Russia). In particular, the limitations would include the introduction of certain customs duties and restrictions on the country's voting rights within the union. The Government of Armenia expected that joining the Eurasian Economic Union would reduce the prices of natural gas and nuclear fuel and would provide Armenia with markets for its products and investment capital for its companies (Regnum.ru, 2013; Naberezhnov, 2015).

Minerals in the National Economy

In 2014, Armenia's real gross domestic product (GDP) increased by 3.9% compared with an increase of 4.6% in 2013. The nominal GDP in 2014 amounted to $10.9 billion.[1] The share of industrial production in the total GDP was 31.6%, and the share of the mineral industry in total industrial production was 12.8%. In 2014, mining of metallic ores dominated the mining and quarrying sector, accounting for 98.1% of the value of production in this sector. In 2014, industrial production increased by 2.7% compared with that of 2013; mining and quarrying decreased by 7.4%; and mining of metallic ores decreased by 7.3%. (National Statistical Service of the Republic of Armenia, 2014; 2015b; U.S. Central Intelligence Agency, 2015).

Production

In 2014, Armenia's estimated production of steel rebar increased 12.5 times owing to the opening of a new plant at the end of 2013. Production of rhenium increased by 17.8%; that of mined gold, by 15%; rolled aluminum, by 10.7%; aluminum foil, by 5.5%; and cadmium, by 5.3%. Production of bentonite decreased by 95%; perlite, by 74%; caustic soda, by 42%; and cut diamond, by 36.2%. Output of gypsum decreased by 22%; copper in concentrate, by 15.7%; and primary copper metal, by 8.9%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of companies working in Armenia's mineral industry.

Mineral Trade

In 2014, Armenia had a significant trade deficit as the country's exports, which were valued at $1.52 billion, were much lower than the country's imports of $4.40 billion. Mineral commodities constituted a significant share of the country's export revenue. The main export commodities were cut diamond, energy (electric power), foodstuffs, nonferrous metals, pig iron, unwrought copper, and other mineral products. Overall, exports of mineral and energy products accounted for $386 million, or 25.4% of the country's export revenue. Out of that amount, exports of copper ores and concentrates accounted for $236 million (61.1%); electrical energy, for $81 million (21.1%); precious metal ores and concentrates, $32.7 million (8.5%); zinc ores and concentrates, $13.8 million (3.6%); molybdenum ores and concentrates, $8.7 million (2.7%). Exports of pearls, precious stones, and precious metals accounted for $228 million, or 15% of the country's total exports; among them, cut diamond accounted for $118 million (51.8%) and unwrought gold accounted for $81.9 million (35.9%). Exports of base metals and articles made of them accounted for $302 million, or 19.9% of the country's export revenue. Among them, ferroalloys contributed $109.7 million (36.2%); aluminum and articles made of it, $93.3 million (30.9%), and copper and articles made of it, $75.4 million (24.9%). The main export partners of Armenia in 2014 were Russia (which accounted for 20.3% of Armenia's export revenue), China (11.3%), Germany (10.4%), Canada (6.1%), the United States (5.8%), Bulgaria and Iran (5.6% each), Georgia (5.5%), Iraq (5.3%); the Netherlands (4.9%), and Belgium (4.1%). In 2014, Armenia's imports of mineral products included rough diamond, natural gas, and petroleum. The main trade partners for imports were Russia (which provided 24.9%, by value, of Armenia's imports), China (9.5%), Germany (6.4%), Turkey (5.3%), Iran (4.7%); Ukraine (4.6%); Italy (4.1%), Switzerland (3.3%), and the United States (3.0%) (National Statistical Service of the Republic of Armenia, 2015a, b; U.S. Central Intelligence Agency, 2015).

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[1] Where necessary, values have been converted from Armenian drams (AMD) to U.S. dollars (US$) at an annual average exchange rate of AMD415=US$1.00 for 2014.

Commodity Review

Metals

Aluminum.—The ARMENAL aluminum foil rolling mill was one of the leading production facilities in Armenia and the only producer of aluminum foil in the Caucasus and Central Asia regions. In 2014, the plant employed about 700 workers at an average monthly wage of 366,000 drams (about $882), which was an increase of 9.2% compared with that of 2013. Aluminum foil from ARMENAL was exported to 15 countries in Africa, Asia, Europe and North America; the United States was the leading consumer of ARMENAL's foil. In 2014, the plant completed about 1,800 export orders. In 2014, ARMENAL produced 29,231 metric tons (t) of aluminum foil, which was an increase of 5.5% compared with the 2013 production volume. The plant planned to increase production to 33,600 t in 2015 or 2016 and to 40,000 t by 2020 (MetalDaily.ru, 2014; Delovoy Ekspress, 2015; Regnum.ru, 2014b, 2015; United Company RUSAL, 2015).

Copper.—In 2014, Armenia had three enterprises engaged in mining copper—Agarak copper-molybdenum Mining and Processing Complex (ACMC), Dundee Precious Metals Kapan, and Zangezur copper-molybdenum Complex (ZCMC); of the three, ZCMC was the leading producer. ACMC and ZCMC also produced molybdenum and rhenium as a byproduct of copper production. In Armenia, copper production was a significant source of export revenue, and copper producers were among the most significant taxpayers. In 2014, Armenia exported 185,000 t of copper concentrate and received $236 million. In the same year, ZCMC was the fourth-ranked taxpayer in the country, having paid about 20 billion drams ($48.2 million). The decrease in world copper prices, however, significantly affected Armenia. In 2013, the country exported 173,000 t, or 12,000 t less than in 2014, but received the revenue of $280 million, or $44 million more than in 2014 (Hetq.am, 2015).

In December, ZAO Teghout opened a new mine at the site of the Teghout copper-molybdenum deposit. In the first year of the operation, it was planning to mine and process 7 million metric tons per year (Mt/yr) of ore and then to increase annual ore processing to 7.5 million metric tons (Mt) in 2016 and 9 Mt in 2017. The company anticipated that ore mining and processing would be between 12 and 14 Mt/yr in about 5 years. During the first 10 years of operation, the company was expecting to produce 64,000 metric tons per year (t/yr) of copper concentrate with copper content of 31% and about 760 t/yr of molybdenum concentrate with molybdenum content of up to 50%. To address environmental and cultural concerns related to development of the deposit, the company was planning to plant trees in an area of 714 hectares to replace the 375 hectares of the Teghout Forest that would be cut when the mine was developed. Also, the Institute of Archeology and Ethnography will provide oversight during mining activities to identify any culturally significant artifacts that may be discovered (Manukyan, 2014; Regnum.ru, 2014c).

The Teghout deposit is located in northern Armenia, in Lori Martz, near the border with Georgia. The estimated resources of the Teghout deposit were 450 Mt at 0.355% copper (1.6 Mt of contained copper) and 0.022% molybdenum (99,000 t of contained molybdenum). The deposit was considered to be the second-largest deposit in Armenia (after the Kajaran deposit) based on its resources. ZAO Teghout was founded in 2006 and was a part of the Vallex Group (Manukyan, 2014; Regnum.ru, 2014c).

In October, the Eurasian Development Bank (EABR) and the bank of the Eurasian Economic Union, which Armenia recently joined, agreed to provide an $11 million loan to ZAO Sagamar for a period of 5 years. ZAO Sagamar had a development license for the gold-polymetallic deposit Armanisskoye, which is located within 5 kilometers (km) of the town of Stepanakert in Lori Martz. The borrowed funds would be spent on exploration activities, mine development, the purchase of mining equipment, and the refinancing of existing loans. The total cost of the project was estimated to be $70 million. EABR representatives stated that the loan was the bank's first investment project in the country. The Armanisskoye deposit had significant resources of cadmium, copper, gold, lead, silver, and zinc; the Armanisskaya beneficiation plant, which was built in 2011, had the capacity to process up to 550,000 t/yr of polymetallic ore. ZAO Sagamar was a part of Global Metals Group and had been developing the deposit since 2002 (Ecolur.org, 2011; Evraziyskiy Bank Razvitiya, 2014; Regnum, 2014a).

Gold.—In 2014, Armenia produced 3,994 kilograms (kg) of gold, which was a 15% increase compared with the 2013 production volume. In 2014, Armenia exported 3.6 t of gold valued at about $82 million, which was an all-time record. Over the past several years, the country significantly increased its exports of gold. In 2013, Armenia exported 2,730 kg of gold, while in 2008, the country exported only 252 kg. (HayastanNews.com, 2015).

The Ararat Gold Recovery Co. (AGRC), which was also known as GPM Gold, continued to mine the Sotk (Zod) deposit. AGRC (a subsidiary of GeoProMining of Russia) had a gold processing facility in the city of Ararat. In April 2014, AGRC completed a technical modernization that cost a total of $140 million and included the application of Albion Process™ technology and completion of a new beneficiation plant in Ararat City. The Albion Process™ was initially developed by Glencore plc of Switzerland and was previously used in Germany, Spain and the Dominican Republic; Armenia was the fourth country in the world where this technology was used to treat refractory gold. AGRC expected that the new technology would allow the company to increase gold production to 4,500 kilograms per year (kg/yr) in 2015 and beyond. (Arka.am, 2014c).

In 2014, ZAO Geoteam of Armenia, which represented Lydian International Ltd. of the United Kingdom, was continuing exploration and preparation for development of the Amulsar gold deposit located in southeastern Armenia between the Arpa and the Vorotan Rivers. According to the most recent estimates, the proven and probable reserves of Amulsar were 70.3 t of gold and 300 t of silver; measured and indicated resources of gold were estimated to be 74.6 t, and inferred resources, 53 t of gold. The company was planning to begin producing gold on a commercial scale in 2016. The company already invested about $46 million in exploration and the cost of mine construction was estimated to be $270 million. Geoteam was planning to produce about 6,200 kg of gold per year. Among the shareholders of Lydian International were the International Financial Corporation (IFC) and the European Bank for Reconstruction and Development (EBRD) (Delovoy Ekspress, 2014c).

In October, Armenia's Central Bank and Technosert SA of Switzerland signed a memorandum of understanding concerning construction of a precious metals refinery to process gold and silver. The refinery would process gold and silver concentrates produced in Armenia. The function of the new enterprise would be to produce 99.99% standard gold bullion and sell it in Armenia and on international markets; the envisioned company would also provide complex services, such as investment consulting and portfolio management, to investors (Volkov, 2014).

Iron and Steel.—In October 2013, a new metallurgical plant opened in the city of Charentsavan in the Kotaiks region, which is located 25 km to the northeast of Yerevan. The total investment in the plant was estimated to be $30 million, more than 70% of which was the cost of the equipment itself. The new plant was producing steel-reinforcing bars (rebar) from metal scrap collected in Armenia; the existing supply of scrap in the country was estimated to be sufficient to provide raw material for the plant for the next 10 years. The plant's rolling mill would have the capacity to produce 125,000 t/yr of steel starting in 2014; at the time of opening the plant was operating at about 30% of its full capacity (News.am, 2013; Delevoy Ekspress, 2014b).

By November 2014, the plant reached a capacity of about 50,000 t/yr and was meeting about 60% of domestic demand for rebar. In 2015, the company was planning to start production of metal balls for the mining industry and to reach a production capacity of 20,000 t by the end of the year. In 2014, the plant employed 450 people; production of metal balls would create jobs for another 100 workers. In 2016, the plant was anticipating installation of an additional furnace and an expansion of production that would enable it to export some of its products (Arka.am, 2014b; Delevoy Ekspress, 2014b).

Industrial Minerals

Cement.—In 2014, Armenia produced 427,000 t of cement, which was a slight decrease compared with the 431,000 t produced in 2013. In 2014, Armenia exported 73,000 t of cement, which was a significant decrease compared with the 112,200 t exported in 2013. Experts suggest that the reason behind the decrease was the recent opening of a new HeidelbergCement plant in neighboring Georgia, which reduced that country's need to import cement to satisfy its domestic demand (Bizzone.info, 2015).

In 2014, Armenia had two cement plants—the Mika Cement (also known as the Hrazdan Cement Plant) and the ZAO Ararat Cement Plant. Both plants were closed stock companies and, in the past decade, produced cement in an amount well below their capacities because of low levels of construction activity in Armenia. Mika Cement had two cement production lines and the capacity to produce up to 1.2 Mt of cement in 10 different types of portland cement. At the beginning of 2014, the owners of Mika Cement went bankrupt, and the shares of the company were retained by the VTB Bank (Armenia). Production at the cement plant was stopped in April and the plant was not in operation until July, when VTB Bank provided an operating loan to the plant. The bank indicated that it wanted to preserve the cement plant as it was important to the town of Hrazdan, and it was looking to sell Mika Cement. As of yearend 2014, the plant employed 410 workers (Delovoy Ekspress, 2014a; Arka.am, 2015a, b).

Mineral Fuels and Related Materials

Uranium.—In August, the Government announced that it would agree to increase the charter capital of ZAO Armenian-Russian Mining Company (ARMC), which was a joint venture of the Government and OAO Atomredmetzoloto (ARMZ) of Russia, for uranium exploration in Armenia. The company had a monopoly right to conduct exploration for uranium in the country, without any restrictions or area specifications. ARMC was created in 2008, and the partners had a total of 300 shares (150 shares each) in the nominal charter capital. As of January 1, 2014, the value of the charter capital was 989.5 million drams ($2.4 million). The Russian partner contributed $3 million in exploration work. In 2014, ARMZ added 95 million drams (about $229,000) to the charter capital, and the Government of Armenia contributed the same amount in the form of geologic information. The company's license was to expire in 2015 (AtomInfo.ru, 2009; Arka.am, 2014a; Ecolur.org, 2014).

Outlook

In the next few years, Armenia is likely to significantly increase its gold production, which could make a gold refinery economically viable. Armenia is also likely to continue producing copper, molybdenum, and rhenium. The country's ability to increase production of industrial minerals in the near future would probably depend on many factors, including building better infrastructure to facilitate exports. After Armenia joins the Eurasian Customs Union, the country's economy could receive a boost from lower energy prices and better access to the capital markets of Kazakhstan and Russia, or it could slow down because of the recessionary trends in the countries of the Eurasian Economic Union.

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TABLE 1
ARMENIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Rolled		27	26	21	18	20
Foil		24,617	25,289	26,243	27,700	29,231
Cadmium		3	--	43	41	43
Copper:						
Concentrate, Cu content		31,062	33,597	41,220	48,887	41,216
Blister, smelter, primary		7,644	8,876	10,075	10,771	9,814
Ferromolybdenum		5,126	5,525	5,836	6,619	6,528
Gold, mine output, Au content	kilograms	1,946 [r]	2,736	2,896	3,473	3,994
Molybdenum:						
Concentrate, Mo content		5,408 [r]	5,745 [r]	6,525 [r]	6,900	7,162
Metal		466 [r]	486	675	746 [r]	748
Rhenium	kilograms	183 [r]	254 [r]	293 [r]	298 [r]	351
Silver	do.	21,892 [r]	25,205 [r]	22,244 [r]	19,458	19,333
Steel, rebar		--	--	--	4,000 [e]	50,000 [e]
Zinc, concentrate, Zn content		7,808	8,475	10,700	10,530	9,710
INDUSTRIAL MINERALS						
Barite[e]		600 [r]	600	600	600	NA
Caustic soda		960	63	82	96	56
Cement	thousand metric tons	488	422	438	431	427
Clays, bentonite		1,397	835	4,987	15,387	798
Diamond, cut	carats	65,000	65,000	67,000	94,000	60,000
Diatomite[e]		220	220	220	220	NA
Gypsum		38,700	34,027 [r]	30,446 [r]	28,679 [r]	22,317
Lime	thousand metric tons	20,595	25,053	27,294	28,238	26,167
Perlite		95	229	181	53	14
Salt		29,400	35,600	38,000	30,800 [r]	30,000
Tuff		83,104	95,402	64,224	53,203	54,514

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through August 19, 2015.

TABLE 2
ARMENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit name	Annual capacity[e]
Aluminum, rolled and foil		ARMENAL (formerly Kanaker aluminum plant) (United Company RUSAL)	Kanaker	29,500
Cement	thousand metric tons	ZAO Ararat Cement plant	Ararat region	1,200
Do.	do.	Mika Cement	Hrazdan	1,200
Copper:				
Mine output, Cu content		Agarak copper-molybdenum Mining and Processing Complex (ACMC) [GeoProMining, Ltd. (GPM)]	Agarak	NA [2]
Do.		Dundee Precious Metals Kapan (Dundee Precious Metals Inc.)	Kapan	NA
Do.		Zangezur copper-molybdenum Complex (ZCMC) [Cronimet Mining GmbH, 60%; OAO Yerevan Pure Iron Plant, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	NA
Do.		ZAO Teghout (Vallex Group)	Lori Martz	NA
Blister		ZAO Armenian Copper Programme (ACP) (Vallex Group)	Alaverdi	15,000
Diamond, cut stones		Aghavni diamond-cutting works[3]	Nor Geghi	NA
Do.		Amma group diamond-cutting works[3]	Artashat	NA
Do.		Andranik-Dashk diamond-cutting works	Nor Hachyn	NA
Do.		Arevakn diamond producing plant	do.	NA
Do.		Diamond Company of Armenia (DCA)	Yerevan	NA
Do.		Diamond Tech	Talin	NA
Do.		Lori diamond-cutting works	Nor Hachyn	NA
Do.		Lusampor[3]	Melik'gyugh	NA
Do.		Punji diamond-cutting works[3]	Yerevan	NA
Do.		Sapphire diamond-cutting works	Nor Hachyn	NA
Do.	thousand carats	Shoghakan gem-cutting plant	do.	120
Gold	kilograms	Ararat Gold Recovery Co. (AGRC) [GeoProMining, Ltd. (GPM)]	Sotk (Zod)	2,000
Do.		Dundee Precious Metals Kapan (DPMK) (Dundee Precious Metals Inc.)	Shahumian deposit, Kapan	NA
Molybdenum:				
Mine output, Mo content		Agarak copper-molybdenum mining and processing complex (ACMC) [GeoProMining, Ltd. (GPM)]	Agarak	2,000
Do.		Zangezur copper-molybdenum complex (ZCMC) [Cronimet Mining GmbH, 60%; OAO Yerevan Pure Iron Plant, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	20,400
Metal, ferromolybdenum		Armenian Molybdenum Production LLC (AMP) (Cronimet Mining GmbH, 51%, and Armenian residents, 49%)	Yerevan	3,600
Do.		OAO Yerevan Pure Iron Plant	Yerevan	NA
Perlite	thousand metric tons	OAO Aragats Perlit	Aragats deposit	1,110
Rhenium		Agarak copper-molybdenum mining and processing complex (ACMC) [GeoProMining, Ltd. (GPM)]	Agarak	NA
Do.		Zangezur copper-molybdenum complex (ZCMC) [Cronimet Mining GmbH, 60%; OAO Yerevan Pure Iron Plant, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	NA
Steel, rebar		Armenian Steel Casting Enterprise (ASCE) Group	Charentsavan	50,000
Zinc, mine output, Zn content		Dundee Precious Metals Kapan (Dundee Precious Metals Inc.)	Kapan	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and the names of locations.

[2] Capacity estimates are totals for all enterprises that produce the commodity.

[3] Current existence of enterprise cannot be confirmed.

THE MINERAL INDUSTRY OF AUSTRIA

By Sinan Hastorun

Austria is a landlocked and highly industrialized European Union (EU) member state in Central Europe that borders the EU countries of the Czech Republic and Germany to the north, Hungary and Slovakia to the east, Italy and Slovenia to the south, and the non-EU countries of Liechtenstein and Switzerland to the west. The country lies at the eastern end of the Alps; the western and southern parts of Austria are dominated by the mountain range, while the lower lying eastern States are situated within the Danube Basin. Of approximately 4,500 mining sites in the country, only a few large-scale mines were in operation in 2014. The Erzberg open pit iron ore mine at Eisenerz in the State of Styria and the underground tungsten mine at Mittersill in the State of Salzburg continued to be the two main metal mines in operation in the country (Geologische Bundesanstalt, 2014e; Embassy of Austria, 2015; European Union, 2015).

Austria continued to play an important role in mineral markets on a world scale for graphite, magnesite, and tungsten. Excluding production (if any) in the United States[1] in 2014, Austria was the fourth-ranked producer of magnesite in the world and the seventh-ranked producer of tungsten and accounted for 2.6% and about 1.0%, respectively, of world production (table 1; Geologische Bundesanstalt, 2014d, h; Bray, 2016, p. 97; Shedd, 2016, p. 175).

Industrial minerals production continued to be an important component of Austria's mineral industry, with the importance of construction minerals increasing significantly in recent decades. Large occurrences of clay, limestone, and sand and gravel were found throughout the country. Austria produced clay, dolomite, graphite, gypsum, kaolin, lime, limestone, magnesite, salt, silica (quartz) sand, and talc. Salt mines still provided an important portion of domestic supply. Both natural gas and crude petroleum were produced in the country, but domestic output met only about 10% of national consumption of mineral fuels. Geothermal energy sources were being developed in eastern and southeastern Austria. The country had a substantial mineral (including metals) processing sector regionally, as well as a substantial capacity to recover metals from secondary sources (tables 1, 2; Geologische Bundesanstalt, 2014a–c, f, g; Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 3–7).

Minerals in the National Economy

Austria's gross domestic product (GDP) increased by 0.4% in 2014, which was slightly above the 0.3% (revised) rate of growth in 2013, and continued to lag economic growth in the euro area. The nominal GDP in 2014 was $436.9 billion. The country's economy had stagnated since the second quarter of 2012 in large part owing to lower growth in exports, in particular to the country's EU trading partners, as well as weak domestic consumption and investment (European Commission, 2015a, p. 104; 2015b, p. 3; Österreichische Nationalbank, 2015, p. 4, 8; Statistics Austria, 2015, p. 1–3; World Bank, The, 2015).

The real gross value added by the mining and quarrying sector, which accounted for about 0.5% of the total value added in 2014, decreased by 5.1% in 2014 compared with a decrease of 0.2% in 2013. The gross value added by manufacturing, which made up 19.2% of the total value added in 2014, increased by 1.3% compared with a decrease of 0.4% in 2013. The gross value added of construction, which accounted for 6.4% of the total value added, decreased by 2.0% after decreasing by the same percentage in the previous year (Österreichisches Institut für Wirtschaftsforschung, 2015a, b; Wirtschaftskammer Österreich, 2015, p. 46).

Austria's marketed mineral industry production was approximately $31.9 billion (EUR25.0 billion[2]) in 2014, which was about 7.6% of the country's GDP, compared with a revised value of $32.8 billion or 8.0% of the GDP in 2013. Of the total value of mineral production in 2014, the value of output of the natural gas and petroleum sector (including production of petroleum refinery products) was $12.9 billion, compared with $14.0 billion in 2013; the ferrous metals sector (including manufacturing of iron and steel and possibly including production of ferroalloys), $9.7 billion, compared with $9.6 billion in 2013; the nonferrous metals sector, $4.6 billion, compared with $4.6 billion in 2013; the building materials, ceramics, and stone sector, $4.0 billion, the same as in 2013; and the mining and quarrying sector, $688 million, compared with $649 million in 2013. The real value of production by the ferrous metals sector increased by 12.3% in 2014; the mining and quarrying sector, by 10.2%; and the natural gas and petroleum sector, by 0.2%. On the other hand, the real value of production by the nonferrous metals sector decreased by 2.7% and that of the building materials, ceramics, and stone sector, by 1.5% (Österreichisches Institut für Wirtschaftsforschung, 2015c; Wirtschaftskammer Österreich, 2015, p. 50).

In 2014, employment in the mineral industry decreased slightly. There were 37,226 employees in the entire industry, including mining support services, and they accounted for about 1.1% of the total number of employees in the country. Average employment in the ferrous metals sector increased by 3.4% to 14,663 workers during 2014; in the building materials, ceramics, and stone sector, it decreased by 2.4% to 13,001; in the nonferrous metals sector, it increased by 2.0% to 6,115; in the natural gas and petroleum sector, it increased by 1.8% to 2,217; and in the mining and quarrying sector, it decreased by 0.2% to 1,715 workers (Wirtschaftskammer Österreich, 2014, p. 33, 35, 47, 51; 2015, p. 33, 35, 47, 51; Österreichisches Institut für Wirtschaftsforschung, 2015d, e).

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[1] U.S. data were withheld to avoid disclosing company proprietary data.

[2] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783=US$1.00 for 2013.

Government Policies and Programs

The basis of Austria's mining law is the Mineralrohstoffgesetz (MinroG) (Federal Law BGBl. I No. 38/1999), or "Mineral Resources Law" of 1999, which applies to mineral exploration, production, and processing of minerals and the use of geologic structures for holding or storing substances, such as liquid and gaseous mineral fuels. Austria's mineral resources are legally classified into three main categories: Bergfreie (free mineral raw materials), Bundeseigene (state-owned mineral raw materials), and Grundeigene (other mineral raw materials). The Bergfreie minerals include metallic ores, such as iron ore and tungsten (scheelite); oil shale; and many industrial minerals, including clays (such as bentonite and kaolin), diatomite, graphite, gypsum, limestone, magnesite, marble, silica sand, and talc. The holder of the mining license for minerals in this category holds ownership of resources of the licensed deposit. The Bundeseigene minerals include mineral fuels, such as petroleum and natural gas, and related materials, such as uranium and salt. The resources in this category are state owned, no matter who is awarded a license to extract and produce them. The Grundeigene minerals include stone, sand, and gravel not included in the first category and feldspar. The resources in this category belong to the owner of the land, but a mining license is required for extraction (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 14–16, 19–26; 2015d).

The Federal Ministry of Science, Research, and Economy (BMWFW) regulates mineral exploration and extraction in Austria. According to Sec. 119 of MinroG, the BMWFW's authorization is required for any mining activities begun on the surface. No separate operating permit is generally required. Under the Environmental Impact Assessment (EIA) Act, an EIA must be conducted when hydrocarbon exploration exceeds 500,000 cubic meters per day (250,000 cubic meters per day in a special protected area). EIA decisions are issued by the BMWFW and the government of the State where the site of petroleum or natural gas exploration or extraction is located (Rajal and Schmelz, 2015).

The Austrian Mineral Resources Plan constituted a core element of the new Austrian Minerals Policy. The strategy was aimed at securing the supply of minerals to Austria's industrial sector, given its heavy dependence on raw materials, from both EU and non-EU sources and increasing resource use efficiency. The main purpose of the mineral resources plan was to identify mineral occurrences and conflict-free areas in Austria (defined in terms of not being in contradiction with land-use planning) that contained mineral resources. Such domestic areas were designated as raw material safeguarding areas under State or municipal authority (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015b, c).

In July 2014, the Parliament passed the Federal Energy Package and enacted the Federal Energy Efficiency Act of 2012 ("Bundes-Energielenkungsgesetz") to transpose the EU Directive on Energy Efficiency 2012/27/EU through increased energy efficiency obligations for business enterprises, energy suppliers, and the Federal Government. Also in July 2014, the Parliament passed an amendment to the Electricity Tax Act ("Elektrizit*ä*tsabgabegesetz") in order to support national energy production from renewable energy sources. The amendment exempted producers of renewable energy from taxation for own-use production up to 25,000 kilowatthours per year (Rajal and Tuttinger, 2015, p. 34–35).

Production

Data on Austria's mineral production are in table 1. Of the two major minerals produced in Austria, magnesite (crude) output increased by 6%, while tungsten ore (gross weight) output increased by 3%. Minerals whose production showed significant change from 2013 included nickel, whose output increased by about 98%; rock salt, by 33%; gasoline, by 21%; quartz, by 19%; dolomite and oil shale, by 17% each; gypsum and anhydrite, by 15%; quartz sand, by 13%; granite and granulite, by 12%; and secondary aluminum, marketed lime, and basalt, by 8% each. The production of residual fuel oil decreased by 15%; that of gneiss, by 12%; natural gas liquids and kerosene and jet fuel, by 11% each; and kaolin, by 9% (table 1).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities. Many mineral producers and processors (including most of the producers of industrial minerals) in Austria are small- and medium-scale ("Mittelstand") family-owned companies and are not listed in table 2 owing to the lack of available information concerning their production capacities.

There was a slight increase in the number of active mining and quarrying operations in Austria in 2014. There were reportedly 1,148 mining and quarrying operations and 2 operations that produced natural gas and (or) crude petroleum in 2014 compared with 1,056 and 3, respectively, in 2013. Of the mining and quarrying operations in 2014, 1,134 produced industrial minerals (1,044 in 2013), including 1,131 open pit mines or quarries (1,031 in 2013), 10 underground (nonsalt) industrial mineral mines (9 in 2013), and 4 underground salt mines (4 in 2013). Two mines produced iron ore and micaceous iron oxide, and one mine produced nonferrous metals (tungsten) in both 2013 and 2014. Almost all the mineral companies operating in Austria were owned privately, but the Government owned 100% of the currently nonproducing coal company Graz-Koflacher Eisenbahn und Bergbaugesellschaft GmbH and 31.5% of the oil and gas company OMV Aktiengesellschaft (table 2; Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2014, p. 13; 2015a, p. 9).

Mineral Trade

The total value of Austria's exports increased by 1.7% to $163.1 billion in 2014, while its imports decreased by 0.8% to $165.4 billion. European countries including Russia and Turkey, and in particular, other EU member states, continued to be Austria's main trading partners. Europe accounted for 79.8% of Austria's total exports and 80.7% of its total imports in 2014, by value, whereas the EU member states accounted for 68.8% of exports and 71.3% of imports. Germany was Austria's leading trading partner, accounting for a 29.8% share of its exports and 37.4% of its imports (Wirtschaftskammer Österreich, 2015, p. 59, 62, 64).

The value of Austria's exports of raw materials (including nonfuel minerals and nonmineral raw materials, such as wood) decreased slightly to $4.8 billion in 2014 and accounted for 3.0% of total exports in 2014 compared with 3.1% in 2013. The value of the country's imports of raw materials decreased to $7.4 billion in 2014 from $7.5 billion in 2013 and accounted for 4.4% of total imports in 2014. The value of exports of fuels and energy (including mineral fuels and electricity) decreased to $4.0 billion in 2014 from $4.3 billion in 2013 and made up 2.4% of total exports in 2014. The value of imports of fuels and energy decreased to $16.6 billion in 2014 from $18.9 billion in 2013 and made up 10.1% of total imports in 2014. Thus, Austria's trade balance for energy, fuels, and raw materials (including most of the mineral trade balance as a subset) was -$15.2 billion in 2014 compared with -$17.2 billion in 2013 (Wirtschaftskammer Österreich, 2014, p. 60–61; 2015, p. 60–61).

Processed metals and industrial mineral products accounted for a greater proportion of the total value of output of Austria's mineral industry than did mineral raw materials. Manufactured ferrous metals (including iron and steel and possibly including ferroalloys) made up 5.4% of all exports in 2014; nonferrous metals (including such products as aluminum and tungsten carbide, metal, and oxide powders), 2.4%; and nonmetallic mineral products (including such products as cement), 1.7%. In terms of imports, their shares were 2.7%, 2.5%, and 1.5%, respectively. Austria's exports of manufactured ferrous metals increased in value to $8.8 billion in 2014, and that of nonmetallic mineral products increased to $2.8 billion. Exports of nonferrous metals decreased to $3.8 billion. Imports of ferrous metals remained about the same at $4.5 billion and that of nonferrous metals at $4.2 billion. Imports of industrial mineral products increased to $2.4 billion. Thus, Austria's trade balance for processed mineral products decreased to about $4.3 billion in 2014. The trade surplus in this sector of the mineral industry, however, was not enough to overcome the country's overwhelming trade deficit in energy, fuels, and raw materials (Wirtschaftskammer Österreich, 2014, p. 60–61; 2015, p. 60–61).

Austria's exports to the United States were valued at $10.8 billion and its imports from the United States totaled $3.8 billion in 2014. Mineral exports to the United States included, in descending order of value, iron and steel mill products ($177.3 million), bauxite and aluminum ($118.2 million), iron and steel manufactures ($93.7 million), advanced iron and steel products ($59.7 million), nonferrous metals ($42.5 million), sulfur and nonmetallic minerals ($21.5 million), petroleum products ($8 million), fertilizers ($7 million), and other precious metals ($5.4 million). Mineral imports from the United States included, in descending order of value, nonferrous metals ($70 million), metallurgical grade coal ($47.9 million), copper ($20.1 million), finished metal shapes ($14.1 million), iron and steel mill products ($6.3 million), nonmonetary gold ($4.4 million), other iron and steel products ($4 million), fertilizers ($3.3 million), aluminum and alumina ($2.3 million), and other precious metals ($1.4 million) (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Aluminum.—AMAG Austria Metall AG's global sales of aluminum and aluminum products increased by 6.9% to 375,900 metric tons (t) in 2014; of the total, 352,100 t was exported, which was an increase of 6.8%. The company's casting division delivered two-thirds of its shipment volume to the automotive industry. In September 2014, AMAG launched a new hot-rolling mill in Ranshofen in the State of Upper Austria, and completed the construction of a new plate production center at the end of the year as part of its AMAG 2014 expansion project, which it had initiated in 2012. The production capacity of the company's rolling division increased to 225,000 metric tons per year (t/yr) of aluminum metal in 2014 from 150,000 t/yr in 2012 as a result of this expansion. The division's shipments increased to 170,000 t in 2014 from 158,000 t in 2013. In November 2014, the company initiated the AMAG 2020 project that entailed an investment of EUR300 million ($383 million) to increase capacity to more than 300,000 t/yr. AMAG expected to begin operating a new cold-rolling mill in 2017 (AMAG Austria Metall AG, 2015, p. 9, 10, 17, 43).

Gold.—Noricum Gold Ltd. of the United Kingdom held two mining licenses in Rotgülden and Schonberg. In 2014, based on exploration results that confirmed the presence of up to eight veins along a 3-kilometer (km) strike, the company decided to focus its drilling program on the Schonberg project, which was centered on the towns of Knittelfeld and Flatschach. Soil sampling covering 2.5 km of strike formed the basis of Noricum's first 2,000-meter (m) drilling program in Schonberg. Results contained up to 3.82 parts per million (ppm) of gold and 8,640 ppm of copper. In September 2014, Noricum Gold began drilling at Weissenbachgraben, which was one of the three mining license areas in Schonberg. The company's Rotgülden mine target, which had produced gold in the past, remained prospective. Rock-chip sampling at the Altenberg prospect of the license area indicated grades of up to 86.4 grams per metric ton (g/t) gold and 1,000 g/t silver. Noricum Gold planned to conduct a 2,500-m surface diamond drilling program at Rotgülden before its authorization expired in November 2018 (Noricum Gold Ltd., 2015a, p. 3; 2015b, c).

Iron and Steel.—VA Erzberg GmbH's production of iron ore increased by 3.8% to reach 2.4 million metric tons (Mt) in 2014. The company annually processed about 9 Mt of rock to produce iron, which was then supplied to voestalpine Stahl GmbH's plants in Linz and Donawitz to produce steel. Voestalpine Stahl produced 5.7 Mt and sold 5.1 Mt of crude steel in the business year 2013–14; the company's steel output and sales were both record highs (VA Erzberg GmbH, 2014, p. 1; voestalpine Stahl GmbH, 2014, p. 3; Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 29).

In May 2014, VA Erzberg launched its new, fully automated iron ore storage at the Styrian Erzberg Mine. The $16 million project was the biggest investment in the mine in 30 years. Compared with the previous method of storage of tipping of the fine ore by heavy-duty trucks and further transportation by wheel loader, the automated storage was expected to improve ore quality by increased homogenization and to achieve cost optimization and significant carbon emissions reduction of nearly 1,000 tons of CO_2 per year (VA Erzberg GmbH, 2014, p. 1).

Tungsten.—The Mittersill tungsten mine, which was owned by Wolfram Bergbau und Hütten AG, a subsidiary of Sandvik AB of Sweden, extracted 499,883 t of tungsten ore in 2014 compared with 487,310 t in 2013 in response to stable sales. The company produced 3,500 t of tungsten concentrate and recovered more than 819 t of WO_3 in tungsten concentrate in 2014, which were wholly processed at Wolfram Bergbau und Hütten's conversion plant in St. Martin, Styria. The mine employed 80 people. The company continued underground exploration core drilling, which identified new reserves at approximately 650 m. Further exploration was planned at this level through investment in new ramp propulsion vehicles (Wolfram Bergbau und Hütten AG, 2014; Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 29–30).

Industrial Minerals

Cement.—Austria's cement industry remained relatively small and fragmented with eight companies, most of which were privately or family owned and controlled. There were nine integrated cement plants and two grinding plants, one of which was decommissioned, spread across the country. Lafarge Perlmooser AG, which was owned by Lafarge Cement CE Holding, a joint venture of Lafarge of France and Strabag SE of Austria, was the market leader in Austria with a 32% market share. The company operated two integrated cement plants with a combined capacity of 2 Mt; its Mannersdorf plant in Lower Austria was the largest cement facility in the country. Wietersdorfer & Peggauer Zementwerke was the second largest cement producer in Austria and also operated two cement plants. LEUBE Baustoffe GmbH was a producer of cement, lime, sand and gravel, and ready-mix concrete. The company was one of the few global producers of white cement. Gipswerk Schretter & Cie. GmbH was a medium-sized mineral company that produced gypsum and lime as well as portland cement (Saunders, 2014, p. 43–48; International Cement Review, 2015, p. 42–43).

Cement producers in Austria have increased the use of alternative kiln fuels, such as tires, plastics, waste oil, animal fats, and bone meal in recent years to reach 72% in 2014. Conventional fuels accounted for the remaining 28% of the energy used for cement production—that is, coal accounted for 18% of the industry's energy needs; petcoke, 8%, and petroleum and natural gas, 1% each (International Cement Review, 2015, p. 43).

The proposed merger between Lafarge and Holcim Cement of Switzerland, two leading global cement companies, would merge Holcim Wien with Lafarge Perlmooser and add the import terminal in Vienna supplied by Holcim Slovakia to its assets. In July 2014, Holcim and Lafarge announced that they planned to divest Lafarge's Mannersdorf cement plant along with other plants in Europe and elsewhere as part of their merger to address market competitiveness concerns of regulatory authorities (Global Cement, 2014; International Cement Review, 2015, p. 43).

Clay and Shale.—Two mining sites, which employed 15 people, produced 36,334 t of raw kaolin in 2014. Kaolin has been produced in Austria for more than 200 years, with peak production of 170,000 t and a workforce of 500 employees in the 1960s and 1970s. The mining of kaolin, which was mainly used as filler and carrier material in paper, paints, plastics, and rubber, and in production of ceramic, cosmetic, glass fiber, and pharmaceutical products, has been carried out exclusively since the 1950s by "Kamig" Österreichische Kaolin- und Montanindustrie AG Nfg. Komm. Gesellschaft (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 34).

Graphite.—Austria's graphite production has declined since its peak in the 1960s, when annual output by eight facilities had reached more than 100,000 t. In 2014, Grafitbergbau Kaisersberg GmbH produced graphite for specialty markets in St. Stefan ob Leoben. Extraction had resumed at the site in 2008 (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 32).

Gypsum and Anhydrite.—Eight active mining sites across Austria produced 729,892 t of gypsum and anhydrite in 2014 through both surface and underground mining. They employed a total of 50 people. The main producers were the same as in 2013: Knauf GmbH, Saint-Gobain Rigips Austria GmbH, Moldan Baustoffe GmbH & Co. KG, and Gipswerk Schretter & Cie. Filling work continued in the former Preinsfeld gypsum mine of Gipsbergbau Preinsfeld GmbH. Nachfolger K.G.; there was no extraction at the site (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 32).

Limestone.—Sixty-four mining sites produced a total of 7.9 Mt of limestone in 2014 compared with 61 sites that produced 7.2 Mt in 2013. A total of 381 people were employed in this activity. The main limestone producing companies were Hollitzer Baustoffwerke Betriebs GmbH., Josef Christandl GmbH., Kanzel Steinbruch Dennig Gesellschaft Ltd., Karl Freingruber Gesellschaft Ltd., die GRUBER SAND-KIESSTEINE GMBH, Baumeister Ing. Peter Keckeis GmbH. & Co. KG, Franz Stöckl Gesellschaft Ltd., die Hans Zöchling GmbH and Gebrüder Haider, Bauunternehmung GmbH. In 2014, residual marl stocks were used to complete a rubble landfill on the main floor of Lafarge Cement's Retznei cement plant (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 61).

Lithium.—Global Strategic Metals (GSM) NL obtained mining licenses in perpetuity from the BMWFW for the 80%-owned Wolfsberg Lithium Project in the State of Carinthia in April 2014, which was interpreted as a major step towards becoming the second lithium producer in Europe after Portugal. The project comprised 22 original and 32 overlapping exploration licenses and a mining license over 11 mining areas. The 5-year term of the original exploration licenses was extended to December 31, 2019. The inferred resources of the project were 16.9 Mt at 1.6% lithium oxide. GSM had completed its bulk sampling in December 2013 and intended to use some of the mined ore to update the metallurgical test work undertaken by the North Carolina State Minerals Research Laboratory in the 1980s. In January 2014, the company obtained a suspension of the requirement for annual performance of mining for the years 2014 and 2015 in order to undertake technical studies. In July 2014, GSM announced plans to separate its lithium and silver businesses. In November 2014, this was accomplished by spinning its subsidiary European Lithium Ltd. off as a mining exploration and development company, which was wholly owned by the Wolfsberg Lithium Project. European Lithium planned to begin construction at Wolfsberg by early 2017 and to start production by the end of 2018 (Proactive Investors, 2014a, b; European Lithium Ltd., 2015a–c).

Magnesium Compounds.—Ten active mining sites (eight in Styria, one in Carinthia, and one in Tyrol), which employed 90 employees, produced 754,096 t of magnesite in Austria in 2014. Styromagnesit Steirische Magnesitindustrie GmbH, which was one of the two main magnesium extractors in Austria, reported that the magnesite market in 2014 was characterized by a slight decrease in demand for caustic burned magnesite and an increase in demand for raw magnesite products. The company produced about 130,000 t of magnesite in 2014; of the total, the Angerer underground mine provided 24,000 t; the Kaintaleck open pit mine, 54,000 t; the Shober Pass open pit mine, 33,000 t; and the Hoehentauern open pit mine, 17,000 t. Styromagnesit Steirische Magnesitindustrie planned to reduce production costs for raw magnesite by investing in new machinery. It purchased 8 hectares of land adjacent to the premises for the sustainable production of the site in St. Katharein-Oberndorf. Despite this substantial investment, the company regarded the market situation for caustic burned magnesite to be difficult owing to competitive disadvantages that it faced as a result of the mandated carbon emissions tax compared with other international caustic magnesite producers, in particular those in China and Turkey (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 10, 37, 38).

RHI AG, which was a global supplier of high-grade refractory products, mined magnesite and dolomite at three locations in Austria. The company used underground mining in Radenthein, surface mining in Hochfilzen, and both underground and surface mining in Breitenau. In October 2014, RHI commissioned a facility to recover fine tailings from the discontinued flotation process in Hochfilzen, which returned up to 30,000 t of residual materials to the production process per year while also relieving the mine. The company continued to expand its raw mineral production capacities in Austria and Turkey and also acquired new assets in Ireland and Norway to increase its mineral self-sufficiency level to about 80% in 2014 (RHI AG, 2015, p. 1, 7, 41).

The mining of dolomite as a solid rock (mining by drilling and blasting) was reported in 2014 from 44 mining sites, which employed 184 people. The main dolomite producers were Baukontor Gaaden mbH, Quarry Harrer mbH, Dolomite Eberstein Neuper GmbH, Grasmann GesmbH & Co KG, the Brixentaler Sand and Kieswerk Markus Schermer e. U. and Leopold Ottersböck GmbH, Anton Traunfellner GmbH, and Mineral Abbau GmbH. (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 57).

Six privately owned companies were engaged in marl extraction in the States of Carinthia, Salzburg, Tyrol, and Upper Austria. They employed 24 people in 2014 compared with 38 people in 2013. Marl production decreased by 3.1% to 962,722 t in 2014 (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 8, 57).

A total of 46 enterprises, which employed 69 people, produced 910,132 t of quartz sand in 2014. Most producers were small businesses and medium-sized enterprises. The leading producers were Quarzwerke Österreich GmbH, Quarzsande GmbH, Krempelbauer-Quarzsandwerk St. Georgen Hentschläger & Co.KG., "Kamig" Österreichische Kaolin- und Montanindustrie AG Nfg. Komm. Ges., Karl Wurz GmbH, BRAMAC Dachsysteme International GmbH. About 35,000 t of feldspar was recovered as a byproduct of silica sand mining at Zelking by Quarzwerke Österreich GmbH (Bundesministerium für Wissenschaft, Forschung, und Wirtschaft, 2015a, p. 10, 37).

Mineral Fuels

In 2013 (the latest year for which comprehensive data were available), Austria's primary energy supply was provided by crude oil and petroleum products (36%), renewable energy sources (in particular, hydropower) (30%), natural gas (21%), and solid fuels including coal (10%). The country was dependent on imports for about 64% of its energy needs (European Commission, 2014, p. 59; 2015c, p. 143, 144).

Natural Gas.—In 2014, natural gas extraction, including petroleum gas, decreased by 9.5% to 1.24 billion cubic meters, of which 992 million cubic meters or about 80% was natural gas and 243 million cubic meters or about 20% was petroleum gas. Though lower than the production volume in 2013, domestic production met about 18% of the nation's gas consumption of about 7 billion cubic meters, with imports accounting for the remaining 82%. Of total natural gas output, about 76% was extracted from the Vienna Basin in Lower Austria and the remaining 24% from the Molasse zone of Upper Austria. Two companies continued to account for all production in Austria: OMV AG, with approximately an 83% share, and Rohöl-Aufsuchungs AG (RAG), with 17%. Natural gas imports decreased by about 10% to 41.8 billion cubic meters, whereas exports decreased by about 15% to 34.4 billion cubic meters. Fifty-one percent of imports (3.8 billion cubic meters) originated from the Commonwealth of Independent States countries (Russia and Kazakhstan) followed by imports from Norway (Fachverband der Mineralölindustrie Österreichs, 2014, p. 11; 2015, p. 11; Polak and Starlinger, 2015).

OMV produced about 1.1 billion cubic meters of natural gas in Austria in 2014 compared with about 1.2 billion cubic meters in 2013. Its proven natural gas reserves in the country amounted to 7.9 billion cubic meters. The company was in the process of transforming into an upstream-focused hydrocarbons company. Its main objective at its Austria-based operations continued to be stabilizing hydrocarbon production. In 2014, RAG operated 150 fields, had 245 hydrocarbon producing and gas storage wells, and drilled 7 news wells in Austria. The company produced 248.7 million cubic meters of natural gas compared with 254 million cubic meters in 2013. Its proven natural gas reserves in Austria amounted to 0.1 billion cubic meters. In January 2014, RAG founded its wholly owned subsidiary RAG Energy Drilling, whose focus was on providing drilling services to hydrocarbon companies with its E200 and E202 rigs. In April 2014, the company completed the second-stage expansion of the 7Fields underground gas storage facility. 7Fields, which was a joint venture between RAG and E.ON Gas Storage GmbH of Germany, had a storage capacity of 1.7 billion cubic meters of natural gas and allowed E.ON to safeguard the annual gas consumption of about 800,000 customers in Austria and Germany. E.ON thus became the second largest marketer of gas storage capacity in Austria (E.ON Gas Storage GmbH, 2014; OMV Aktiengesellschaft, 2015a, p. 9–10; 2015b, p. 9–10; Rohöl-Aufsuchungs Aktiengesellschaft, 2015a, b; 2015c, p. 5).

Petroleum and Petroleum Refinery Products.—In 2014, total crude petroleum and natural gas liquids (NGLs), which included condensates and the liquid proportion of natural gas production, increased by 3% to 944,826 t. Crude petroleum output increased by 4.1% to about 883,016 t, while NGL output decreased by 10.7% to 61,811 t. Of total crude petroleum output, 764,165 t or 87% was extracted from the Vienna Basin and 118,851 t or 13% came from the Molasse zone of Upper Austria and Salzburg. Nearly all NGL output was extracted from the Vienna Basin. OMV provided about 85% of total output, while RAG accounted for the remaining 15%. Crude petroleum imports decreased by 3.6% to 7.5 Mt. Austria's major sources of crude petroleum imports were Kazakhstan (2.5 Mt or 33%), Libya (1 Mt or 13%), and Saudi Arabia (0.8 Mt or 11%). These imports were supplemented by imports of about 6.2 Mt in finished petroleum products, including diesel, fuel oil, and gasoline. Imports of finished petroleum products originated mainly from Germany (3.3Mt or 53%), Slovakia (0.9 Mt or 15%), and Hungary (0.5 Mt or 8%) (Fachverband der Mineralölindustrie Österreichs, 2014, p. 11; 2015, p. 11).

OMV produced about 5.8 million barrels (Mbbl) of crude petroleum and NGL in Austria in 2014, which was an increase from 5.7 Mbbl in 2013. Its proven petroleum and NGL reserves in the country amounted to 45.4 Mbbl. The company put 15 new wells in operation and finalized 3 field redevelopment projects during the year. RAG produced about 992,000 barrels of crude petroleum in 2014, which was about the same as in 2013. Its proven petroleum reserves amounted to 6.3 Mbbl (OMV Aktiengesellschaft, 2015a, p. 44; 2015b, p. 9, 10; Rohöl-Aufsuchungs Aktiengesellschaft, 2015c, p. 5).

The Schwechat refinery, which was wholly owned and operated by OMV, was the only refinery in Austria and one of the largest inland refineries in Europe. It processed domestic and imported crude petroleum and produced a full range of petroleum products for domestic consumption and export. Crude petroleum was delivered to Schwechat by pipeline from the Port of Trieste, Italy, through the Transalpine Line (TAL) and the Adriatic-Vienna Pipeline (AWP). In 2014, the refinery processed about 8.6 Mt of crude at a capacity utilization rate of 90%. About 90% of Schwechat's processed crude was imported, while the remaining 10% was supplied by domestic production. The refinery produced 39% diesel, 21% gasoline, 14% fuel oil, 11% petrochemicals, 8% jet fuel, 4% bitumen, and 3% other products. Its output was not sufficient to cover the country's annual demand for gasoline, jet fuel, and diesel oil (International Energy Agency, 2014a, p. 88; Fachverband der Mineralölindustrie Österreichs, 2015, p. 11).

Shale Gas.—The State of Lower Austria was estimated to contain shale gas reserves sufficient to meet the country's domestic gas demand for a period of at least 20 years, thereby reducing the country's need for imported gas. Austria's current regulatory framework was seen as effectively discouraging the development of these resources; the mandatory environmental impact assessment process for each hydraulic fracturing well required a period of 3 to 4 years (Natural Gas Europe, 2012; International Energy Agency, 2014b, p. 10).

Outlook

Austria is likely to remain a significant producer of magnesite and tungsten in Europe and in the world. The country's crude magnesite and tungsten output are expected to continue to increase, but its caustic magnesite output may decrease owing to competitive cost pressures from foreign producers. Aluminum and iron ore production are expected to increase in the coming years as a result of current capacity expansion projects. Austria has the potential to become a major lithium producer and exporter beginning in 2018, if the Wolfsberg lithium project advances to the extraction phase as planned. The country may also become a modest gold producer, if the Rotgülden and Schonberg projects identify precious metal reserves. The growth of industrial minerals output is largely contingent on whether the domestic and European manufacturing and construction sectors return to robust growth in the coming years. Mineral fuels production in Austria is likely to decrease at a gradual rate.

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TABLE 1
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum, metal, secondary	metric tons	374,837	385,551	383,244	387,415	416,621
Copper, metal, secondary:						
Smelter	do.	92,200	92,200	95,000	94,000[e]	94,000[e]
Refined	do.	113,705	112,610	113,578	82,842[r]	83,190
Iron and steel:						
Iron ore, including micaceous iron oxide:						
Gross weight		2,069	2,207	2,142	2,323	2,437
Fe content		662	706	686	743	780
Metal:						
Pig iron		5,621	5,815	5,751	6,144	6,015
Ferroalloys, electric arc furnace, unspecified[e]		555[r]	739[r]	698[r]	698[r]	698
Crude steel		6,569	7,474	7,421	7,953	7,876
Semimanufactures, hot-rolled products		6,621	6,874	6,850	7,377[r]	7,148
Lead, refined, secondary	metric tons	25,499	26,208	24,500[r]	38,786	37,122
Nickel, including Ni content of ferroalloys[e]	do.	1,900[r]	1,800[r]	1,700[r]	2,090[r]	4,140
Tungsten ore and concentrate:						
Ore:						
Gross weight	do.	429,748	423,790	376,460	487,310[r]	499,883
W content[e]	do.	1,110	975[2]	898[2]	1,165[2]	1,200
Concentrate:						
Gross weight	do.	3,812	3,380	2,760	3,514	3,500
W content	do.	977	861	706	850	819
INDUSTRIAL MINERALS						
Aluminum oxide, fused[e]	metric tons	11,500	12,000	12,000	12,000	12,000
Cement:						
Clinker		3,097	3,176	3,206	3,150[e]	3,200[e]
Hydraulic		4,254	4,427	4,455	4,385	4,400
Clays:						
Kaolin, crude	metric tons	58,956	56,976	43,174	40,055	36,334
Unspecified, possibly including bentonite, brick clay, and illite		1,860	1,927	1,794	1,700[e]	1,600[e]
Diabase (of basaltic rocks)		1,762	2,083	1,881	1,817[r]	1,795
Feldspar, byproduct of silica processing[e]	metric tons	27,000	27,000	32,000	35,000	35,000
Graphite, crude	do.	420	925	219	200	200[e]
Gypsum and anhydrite, crude		872	815	792	635	730
Lime, including quicklime		774	801	781[r]	780[r]	830[e]
Of which, marketed		492	528	510[r, e]	510[r, e]	550[e]
Magnesite:						
Crude		757	868	779	714	754
Sintered or dead burned		264	293	270[e]	250[e]	250[e]
Caustic calcined		52	57	55[e]	50[e]	50[e]
Mica[e, 3]	metric tons	3,430	3,590	3,400	3,400	3,400
Nitrogen, N content of ammonia[e]		400	400	400	400	NA
Salt (NaCl):						
Brines, gross	thousand cubic meters	3,608	3,809	3,193	3,717	3,847
Evaporated, mechanical heating process		1,072	1,150	952	1,110[r]	1,150
Rock	metric tons	95	169	222	184	245
Mine output, NaCl content		1,083	1,143[r]	958[r]	1,115[r]	1,154
Sand and gravel:						
Dolomite, loose rocks and gravel		2,620	2,870	2,661	2,709	2,751
Quartz (silica) sand		939	898	820	803[r]	910
Sand and gravel, unspecified		24,128	25,046	23,980	24,271[r]	25,722

See footnotes at end of table.

TABLE 1—Continued
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued						
Sodium compounds, manufactured, n.e.s.[e, 4]		286	301	300	300	300
Stone:						
Amphibolite		1,670	1,318	1,145	1,189	1,180
Basalt, not included in diabase		1,473	1,791	1,363	1,600	1,732
Dolomite		3,942	3,940	3,606	3,804 [r]	4,462
Gneiss		1,505	1,435	1,503	1,490	1,305
Granite and granulite		2,340	3,034	2,704	2,667 [r]	2,974
Limestone, including marble		21,190	21,571	21,226	21,348 [r]	22,695
Marl		1,149	1,484	1,073	993 [r]	963
Quartz, quartzite, and pegmatite		294	285	315	311 [r]	370
Serpentinite		2,013	1,484	1,311	1,507 [r]	1,621
Other, including conglomerate and sandstone		38	47	31	22	17
Sulfur, byproduct of petroleum and natural gas	metric tons	9,873	9,669	10,329	9,789 [r]	9,800 [e]
Talc and leucophyllite (white mica), crude	do.	138,367	132,018	135,665	134,814	131,108
MINERAL FUELS AND RELATED MATERIALS						
Coke		1,388	1,356	1,346	1,348	1,330
Natural gas:						
Marketable (net)	million cubic meters	1,713	1,591	1,729	1,359	1,245
Natural gas liquids[5]	thousand 42-gallon barrels	927	846	830	720	643
Oil shale	metric tons	176	132	540	173	203
Petroleum:						
Crude[6]	thousand 42-gallon barrels	6,167	5,900	5,896	6,235 [r]	6,493
Refinery products:[5]						
Liquefied petroleum gas	do.	1,011	1,175	826	829	792
Gasoline	do.	12,262	13,071	13,464	12,955	15,619
Kerosene and jet fuel	do.	3,780	4,880	4,890	5,186	4,609
Diesel fuel	do.	20,400	25,100	27,100	25,700	27,230
Distillate fuel oil	do.	6,970	4,270	6,050	6,786	6,449
Residual fuel oil	do.	5,070	4,920	4,110	4,949	4,221
Lubricants and miscellaneous oils	do.	672	501	451	515	607
Bitumen, bituminous mixtures, and other residues	do.	1,770	2,280	2,220	1,890	2,146
Other (unspecified)	do.	1,510	1,220	1,624 [r]	1,653 [r]	1,676
Total	do.	53,445	57,417	60,735 [r]	60,463 [r]	63,349

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available.

[1] Includes data available through December 1, 2015.

[2] Reported figure.

[3] Estimated from reported exports minus imports of mica.

[4] Not elsewhere specified. Data could include production of soda ash and sodium sulfate.

[5] Figures converted to barrels from metric tons according to U.S. Energy Information Administration conversion factors.

Source: U.S. Energy Information Administration, 2015, International Energy Statistics—Units: Washington, DC, U.S. Energy Information Administration. (Accessed November 30, 2015, at https://www.eia.gov/cfapps/ipdbproject/docs/unitswithpetro.cfm.)

[6] All figures were converted to barrels from metric tons according to a converson factor of 7.040 barrels of crude oil per metric ton.

Source: U.S. Energy Information Administration, 2015, International Energy Statistics—Europe: Washington, DC, U.S. Energy Information Administration. (Accessed November 30, 2015, at https://www.eia.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=5&pid=53&aid=1.)

TABLE 2
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, fused	Treibacher Schleifmittel GmbH (Imerys S.A., 100%)	Plant at Villach, State of Carinthia	60
Aluminum	AMAG Austria Metall AG (B&C Industrieholding GmbH, 52.7%; RLB OÖ Alu Invest GmbH 16.5%;, AMAG Employees Private Foundation, 11.1%; Treibacher Industrieholding GmbH, 5%; Esola Beteiligungsverwaltungs GmbH, 4.0%; free floating shares, 10.7%)	Secondary ingot plant at Ranshofen, State of Upper Austria	225
Do.	Hammerer Aluminium Industries GmbH	Secondary extrusion plant at Ranshofen, State of Upper Austria	80
Do.	Hydro Aluminium Nenzing GmbH (Norsk Hydro ASA, 100%)	Secondary plant at Nenzing, State of Vorarlberg	59
Do.	Speedline Aluminium Giesserei GmbH (Swiss Alu Trading AG, 100%)	Secondary plant at Schlins, State of Vorarlberg	49
Do.	Aluminum Lend GmbH (Salzburger Aluminium AG, 100%)	Secondary ingot plant at Lend, State of Salzburg	40
Do.	NEUMAN Aluminium Austria GmbH (CAG Holding GmbH, 100%)	Secondary plant at Marktl, State of Styria	16
Do.	Bavaria Industriekapital AG	Secondary plant at Gleisdorf, State of Styria	NA
Do.	Georg Fischer Automotive AG	Secondary plant at Altenmarkt, State of Salzburg; Secondary plant at Herzogenburg, State of Lower Austria	NA
Do.	Nemak Linz GmbH (Tenedora Nemak S.A. de C.V., 100%)	Secondary plant at Linz, State of Upper Austria	NA
Do.	Almaxal Brüder Tschirk GmbH	Secondary plant at Neudörfl, State of Burgenland	NA
Do.	Almeta Metallumschmelzwerk GmbH	Secondary plant at Vienna; secondary plant at Sollenau, State of Lower Austria	NA
Calcium carbonate, ground	Omya GmbH (Omya AG, 100%)	Plant at Gummern, State of Carinthia	2,500
Do.	do.	Plants at Golling, State of Salzburg; Neu Pirka, State of Styria; and Ulmerfeld-Hausmening, State of Lower Austria	NA
Cement	Lafarge Perlmooser AG (Lafarge S.A., 70%, and Strabag SE, 30%)	Plant at Mannersdorf, State of Lower Austria; plant at Retznei, State of Styria; grinding plant at Kirchbichl, State of Tyrol	2,200
Do.	Wietersdorfer & Peggauer Zementwerke GmbH	Plant at Peggau, State of Styria; Plant at Wietersdorf, State of Carinthia	1,200
Do.	Gmundner Zement Produktions- und Handels GmbH	Plant at Hatschek, State of Upper Austria	800
Do.	LEUBE Baustoffe GmbH	Plant at Gartenau, State of Salzburg	770
Do.	Kirchdorfer Zementwerk Hofmann GmbH	Plant at Kirchdorf, State of Upper Austria	500
Do.	Wopfinger Baustoffindustrie GmbH	Plant at Wopfing, State of Lower Austria	300
Do.	Holcim (Wien) GmbH (Holcim Ltd., 100%)	Plant at Vienna	300
Do.	Gipswerk Schretter & Cie. GmbH	Plant at Vils, State of Tyrol	280
Do.	Holcim (Vorarlberg) GmbH (Holcim Ltd., 100%)	Lorüns grinding plant and cement plant at Bludenz, State of Vorarlberg	200
Chalk	Mühlendorfer Kreidefabrik Margit-Hoffman Ostenhof KG (Omya AG, 100%)	Plant at Müllendorf, State of Burgenland	NA
Clays, including brick clay	Wienerberger AG	Clay mines at Göllersdorf, State of Lower Austria; at Rotenturm and Stoob, State of Burgenland; and at Apfelberg and Weißkirchen, State of Styria	NA
Clays, kaolin, and silica sand	Österreichische Kaolin- und Montanindustrie AG	Mines at Weinzierl and Kriechbaum; processing plant at Aisthofen, State of Upper Austria	170
Copper, refined, secondary	Montanwerke Brixlegg AG (A-Tec Industries AG, 100%)	Plant at Brixlegg, State of Tyrol	120 [e]

See footnotes at end of table.

TABLE 2—Continued
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Diabase, basalt	Diabaswerk Saalfelden GmbH (STRABAG SE, 100%)	Mine and plant at Saalfelden, State of Salzburg	NA
Do.	Klöcher Basaltwerke GmbH & Co KG (ASAMER Holding AG, 100%)	Mines and plants at Klöch and Oberhaag, State of Styria	NA
Feldspar	Quarzwerke Österreich GmbH (Quarzwerke GmbH, 100%)	Mine and plant at St. Georgen an der Gusen, State of Upper Austria	NA
Ferroalloys, FeV, FeMo, FeNi	Evonik Treibacher GmbH (Treibacher Industrie AG, 50%; Evonik Industries, 50%)	Plant at Althofen, State of Carinthia	65[e]
Graphite, natural	Grafitbergbau Kaisersberg GmbH	Kaisersberg Mine, State of Styria	3
Gypsum and anhydrite, natural	Moldan Baustoffe GmbH & Co. KG (Salzburger Sand- & Kieswerke GmbH, 100%)	Abtenau and Moosegg Mines, near Kuchl bei Hallein, State of Salzburg	300
Do.	Saint-Gobain Rigips Austria GmbH (Compagnie de Saint-Gobain, 100%)	Mine at Grundlsee and main plant at Bad Aussee, State of Styria; Mine and plant at Puchberg, State of Lower Austria	250
Do.	Knauf GmbH	Hinterstein Mine, Spital am Pyhrn, State of Upper Austria; Mines at Dörfelstein and Tragöß-Oberort, and plant at Weißenbach bei Liezen, State of Styria	160
Do.	Gipswerk Schretter & Cie. GmbH	Mine at Weißenbach am Lech and plant at Vils, State of Tyrol	NA
Iron ore	VA Erzberg GmbH (voestalpine AG, 100%)	Erzberg Mine at Eisenerz, State of Styria	3,000
Iron oxide, micaceous	Kärntner Montanindustrie GmbH	Mine near Waldenstein, State of Carinthia	NA
Lime	voestalpine Stahl GmbH (voestalpine AG, 100%)	Limestone mine near Kremsmauer mountain, and plant at Steyrling, State of Upper Austria	1,200
Do.	Kanzel Steinbruch Dennig GmbH (STRABEG SE, 100%)	Steinbruch plant, municipality of Gratkorn	400[e]
Do.	LEUBE Baustoffe GmbH	Limestone mine near Ofenauer mountain in Golling and plant at Golling, State of Salzburg	300[e]
Lithium	ECM Lithium AT GmbH (Global Strategic Metals NL, 100%)	Mine at Wolfsberg, State of Carinthia	NA[1]
Magnesite, crude	Veitsch-Radex GmbH & Co. OG (RHI AG, 100%)	Mine and plant at Breitenau, State of Styria; Mine at Eichberg, State of Lower Austria; Am Bürgl Mine, area near Weissenstein, State of Tyrol; mine and processing plant at Millstätter Alpe, State of Carinthia	800
Do.	Styromagnesit Steirische Magnesitindustrie GmbH	Angerer, Kaintaleck and Wieser Mines, and plant near Oberdorf an der Laming, State of Styria; Hoehentauern Mine in Murtal, State of Styria Wald Mine in the Schoberpass, State of Styria	150
Do.	CEMEX Austria AG (CEMEX S.A.B. de C.V., 100%)	Mine and plant at Veitsch, State of Styria	NA
Do.	PRONAT Steinbruch Preg GmbH (Schotter- und Betonwerk Karl Schwarzl Betriebsgesellschaft m.b.H., 100%)	Magnesite and dunite (olivine rock) mine at Gulsen, and plant at Preg, State of Styria	NA
Natural gas million cubic meters	OMV Aktiengesellschaft (Free floating shares, 43.3%; Government, 31.5%; International Petroleum Investment Co., 24.9%; own shares, 0.3%)	Main fields in the Vienna Basin, State of Lower Austria, and some fields in the State of Upper Austria	1,800[e]
Do. do.	Rohöl-Aufsuchungs Aktiengesellschaft (EVN AG, 50.025%; E.ON Ruhrgas E&P GmbH, 29.975%; Steirische Gas-Wärme GmbH, 10%; Salzburg AG, 10%)	Main fields in the State of Upper Austria, and some fields in the State of Lower Austria and the State of Salzburg	750[e]
Nitrogen, N content of ammonia	Borealis Agrolinz Melamine GmbH (Borealis AG, 100%)	Plant at Linz, State of Upper Austria	498
Oil shale	Tiroler Steinölwerke Albrecht GmbH & Co. KG	Mine in the Bächental, near Pertisau am Achensee, State of Tirole	NA

See footnotes at end of table.

TABLE 2—Continued
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum, crude	thousand 42-gallon barrels	OMV Aktiengesellschaft (Free floating shares, 43.3%; Government, 31.5%; International Petroleum Investment Co., 24.9%; own shares, 0.3%)	Main fields in the Vienna Basin, State of Lower Austria, and some fields in the State of Upper Austria	6,000 [e]
Do.	do.	Rohöl-Aufsuchungs Aktiengesellschaft (EVN AG, 50.025%; E.ON Ruhrgas E&P GmbH, 29.975%; Steirische Gas-Wärme GmbH, 10%; Salzburg AG, 10%)	Main fields in the State of Upper Austria, and some fields in the State of Lower Austria and the State of Salzburg	1,000 [e]
Petroleum, refined products	do.	OMV Aktiengesellschaft (Free floating shares, 43.3%; Government, 31.5%; International Petroleum Investment Co., 24.9%; own shares, 0.3%)	Schwechat refinery, City of Schwechat, State of Lower Austria	68,600
Rare-earth chemicals and oxides		Treibacher Industrie AG	Plant at Althofen, State of Carinthia	NA
Salt, NaCl content		Salinen Austria AG	Mines at Bad Ischl and Hallstatt, and evaporite saltworks at the Ebensee, State of Upper Austria; mine at Hallein-Dürrnberg, State of Salzburg; mine at Hall in Tyrol, State of Tyrol; mine at Altaussee, State of Styria	1,100
Silica sand		Krempelbauer-Quarzsandwerk St. Georgen Hentschläger & Co. KG.	Burger and Knoll-Wizany Mines at Luftenberg, Krempelbauer and Poscher Mines at St. Georgen, and Treffling Mine at Aigen-Engerwitzdorf, State of Upper Austria	NA
Do.		Quarzwerke Österreich GmbH (Quarzwerke GmbH, 100%)	Mine and plant at Melk, State of Lower Austria; mine and plant at St. Georgen an der Gusen, State of Upper Austria	NA
Do.		Quarzsande GmbH (Zementwerk LEUBE GmbH, 100%)	Mine and plant at Eferding, mine at Bruck-Waasen, and mine at Wolfsegg, State of Upper Austria	NA
Steel, crude		voestalpine Stahl GmbH (voestalpine AG, 100%)	Plant at Linz, State of Upper Austria	6,000
Do.		voestalpine Stahl Donawitz GmbH Co & KG (voestalpine AG, 100%)	Plant at Donawitz (near Leoben), State of Styria	1,500
Do.		Breitenfeld Edelstahl AG	Plant at Mitterdorf im Mürztal, State of Styria	300
Do.		Böhler Edelstahl GmbH & Co KG (voestalpine AG, 100%)	Plant at Kapfenberg, State of Styria	150 [e]
Talc and leucophyllite (white mica)		Naintsch Mineralwerke GmbH (Imerys S.A., 100%)	Talc mines at Lassing and Rabenwald, and plant at Oberfeistritz, State of Styria; talc and mica mine at Kleinfeistritz, and a plant at Weisskirchen, State of Styria	200 [e]
Do.		Aspanger Bergbau und Mineralwerke GmbH & Co. KG (Wietersdorfer & Peggauer Zementwerke GmbH, 100%)	Leucophyllite mine and mica processing plant at Aspangberg-Zöbern, State of Lower Austria	NA
Tungsten:				
Ore (scheelite), gross weight		Wolfram Bergbau und Hütten AG (Sandvik AB, 100%)	Mine at Mittersill and processing plant at Bergla, in the Felbertauerntal, State of Salzburg	500 [e]
Concentrate, W content	metric tons	do.	do.	1,800 [e]
Carbide, powders	do.	do.	Primary and secondary chemical treatment and sintering plant at St. Martin, in the Sulmtal, State of Styria	3,000 [e]
Carbide and metal, powders		Treibacher Industrie AG	Plant at Althofen, State of Carinthia	NA
Metal, powders		Plansee SE (Plansee Holding AG, 100%)	Plants at Liezen, State of Styria, and at Reutte, State of Tirole	NA
Do.	metric tons	Wolfram Bergbau und Hütten AG (Sandvik AB, 100%)	Primary and secondary chemical treatment and sintering plant at St. Martin, in the Sulmtal, State of Styria	3,600 [e]
Oxides		do.	do.	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Under development.

THE MINERAL INDUSTRY OF AZERBAIJAN

By Elena Safirova

Azerbaijan produced a wide range of metals and industrial minerals, including aluminum, copper, gold, iodine, iron ore, limestone, silver, and steel. Its major importance as a world mineral producer, however, was based on its crude oil industry and, more recently, its natural gas industry. The country had been a significant crude oil producer for more than a century, but the focus since independence in 1991 was on developing offshore resources in the Caspian Sea. Oilfield and gasfield development was concentrated in two projects—the Azeri-Chirag-Guneshli (ACG) offshore oilfield complex and the Shah-Deniz offshore gasfield (U.S. Energy Information Administration, 2014).

Minerals in the National Economy

In 2014, the real gross domestic product (GDP) of Azerbaijan increased by 2.8%. The nominal GDP amounted to $75.19 billion,[1] and industrial production contributed 41.5% to the total GDP. Mining and quarrying accounted for 69.6% of the country's industrial output whereas the rest of the industrial output was produced by manufacturing (24.0%) and electricity, heating, and water production and distribution (6.4%). In 2014, industrial production decreased by 0.7%, and production by the extracting sector decreased by 2.1% compared with that of 2013 (State Statistical Committee of the Republic of Azerbaijan, 2015a).

In 2014, Azerbaijan exported about $21.8 billion worth of goods and services, which was a 9.0% decrease compared with export revenues in 2013. Of that amount, 92.5% came from exports of mineral fuels, mineral oils, and products made of them. The main export partners of Azerbaijan were Italy (which received 22.0% of Azerbaijan's total exports), Indonesia (9.2%), Germany (8.8%), Israel (8.1%), France (7.0%), Thailand (3.8%), India and Spain (3.6% each), the United States (3.4%), and Russia (2.9%). Azerbaijan's total imports in 2014 were valued at about $9.2 billion, which was a 14.3% reduction in total imports compared with 2013. The main imported commodities included machinery and equipment (28.1%); base metals and articles made of them (13.6%); food, beverages, and tobacco (9.7%); vehicles, aircraft, and transportation equipment (8.8%); chemicals (7.8%); mineral products (4.9%); and precious stones and precious metals (4.6%). The country's major import partners during the year were Russia (which provided 14.3% of Azerbaijan's imports), Turkey (14.0%), the United Kingdom (10.6%), Germany (7.7%), China (7.6%), the United States (6.1%), Ukraine (4.6%), and Italy (3.0%). In 2014, total foreign trade in Azerbaijan was reduced to $31.0 billion from $34.7 billion in 2013, and the trade balance was reduced to $12.6 billion from $13.3 billion. Despite the reduction, the revenue received afforded Azerbaijan opportunities to continue investing in infrastructure, stabilizing the economy, and reducing poverty in the country (State Statistical Committee of the Republic of Azerbaijan, 2015b).

Production

In 2014, production of copper ore increased by 135%. Estimated production of lime increased by 88%. Crude steel and cement production increased by 29% and 24%, respectively. On the other hand, alumina and caustic soda were not produced at all and sulfuric acid production stopped. Silver production was reduced by 62%, and steel pipe production decreased by 41%. Output of iron ore and estimated output of limestone decreased by 35% each. Gypsum production decreased by 33%; bentonite, by 17%; and iodine, by 11%. These and other data on mineral production are in table 1.

Structure of the Mineral Industry

As of January 1, 2015, the country had 768 enterprises engaged in mineral extraction activities. Of these, 37 were established in 2014, and 6 closed during the year (State Statistical Committee of the Republic of Azerbaijan, 2015a). More specific information about mineral industry enterprises is provided in table 2.

Commodity Review

Metals

Aluminum.—In January, a new aluminum complex was opened in the city of Ganja. The complex was built by OOO Det.Al Aluminum Holding (Det.Al). The complex included two modern plants, which had the capacity to produce 50,000 metric tons per year (t/yr) of aluminum. The first plant would produce raw aluminum and rolled aluminum, and the second plant would specialize in pressure processing and painting products. The first plant had eight furnaces and four rolling mills. The two new plants would employ about 300 workers. For its operations, the company imported alumina from Brazil, Jamaica, the United States, and Venezuela (Contact.az, 2014a; MetalInfo.ru, 2014).

The first stage of the Det.Al complex was opened in January 2012. After the completion of the first stage, Det.Al was able to produce 50,000 t/yr of primary aluminum. The plant had 84 shovel dippers used in electrolysis, and the whole operation was fully automated. The construction of the plant started in 2008, prior to the world financial crisis. Det.Al had plans to eventually increase the capacity of the complex to 200,000 t/yr (1News.az, 2012).

Gold, Silver, and Copper.—In 2009, Anglo Asian Mining PLC (Anglo Asian) of the United Kingdom began gold production at the Gedabek gold, silver, and copper mine, which is located about 55 kilometers (km) from the city of Ganja. At the end of 2013, another mine, the Gosha Mine, which is located about 50 km from Gedabek, started production. In 2014, the company reported producing 1,873 kilograms (kg) of gold; 239 kg of silver; and 772 metric tons (t) of copper. The company stated that it reached its production goals for gold and copper and hoped to continue the positive trend in 2015. Anglo Asian was controlled by R.V. Investment Group Services (51% interest), and the Government of Azerbaijan [through the Ministry of Ecology and Natural Resources (MENR)] owned a 49% interest (Anglo Asian Mining PLC, 2015; Haqqin.az, 2015).

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[1] Where necessary, Azerbaijani manats (AZN) were converted to U.S. dollars (US$) at the average annual exchange rate of AZN0.784=US$1.00 for 2014.

The original production-sharing agreement (PSA) between Anglo Asian and the Government, which was signed in 1997, included development of six deposits in southwestern Azerbaijan—the Gedabek, the Gosha Bulag, the Gyzyl Bulag, the Ordubad, the Soyutlu, and the Vezhnali fields. The Gyzyl Bulag, the Soyutlu, and the Vezhnali fields are located in the breakaway region of Nagorno-Karabakh where conflicts with ethnic Armenians took place from 1988 to 1994. By yearend, the loans taken by Anglo Asian totaled $52.8 million, of which $37 million was owed to the Amsterdam Trade Bank. Other creditors included the International Bank of Azerbaijan ($13.1 million), Pasha Bank ($1 million), Yapi Kredi ($0.9 million), and Atlas Copco ($0.8 million) (Anglo Asian Mining PLC, 2015; Hasanli, 2015a).

In June 2013, Anglo Asian opened a new plant at Gedabek that would process ore using the agitation leaching method. The technology of agitation leaching allows the recovery of up to 90% of the gold contained in the ore compared with up to 70%, which is common for heap leaching. In March 2014, the company installed a Knelson concentrator, with the goal of isolating copper sulfides that were restricting gold recovery rates in the leach tanks. Anglo Asian started copper production using the SART (Sulfidization, Acidification, Recycling, and Thickening) process and achieved significant increases in gold recovery rates in the fourth quarter of 2014. Silver production, on the other hand, showed a 62% reduction compared with that of 2013. By the fourth quarter of 2014, the company produced about 81% of its silver using the SART process; 10%, using heap leaching; and 9%, using agitation leaching (Thomson Reuters, 2014; Hasanli, 2015a).

In May, Anglo Asian and Industrial Minerals SA of Switzerland signed an agreement about the sales of copper concentrates produced from Gedabek. The 3-year contract included sales of both dry and wet copper concentrates. At yearend, Anglo Asian had inventories of 75 t of dry copper concentrate and 550 t of wet copper concentrate ready to be sold. The gold produced at the Anglo Asian mines was transported to Switzerland for purification and refining, and the ingots were transported back to Azerbaijan and held on the Government's bank accounts (Hasanli, 2015a).

Iron and Steel.—In April 2013, the President of Azerbaijan signed a document that would create a steel-producing complex in the country. According to the document, the new complex would be a ZAO (Closed Joint Stock Company) that would be managed by the Cabinet of Ministers, Ministry of Economic Development, and the State Committee on Property. The complex would include such Government-owned production facilities as the OAO Daskesan Filizsaflashdirma (a mining and metallurgical complex) and the OAO Azerboru (a steel plant) (Kurbanova, 2014; Hasanli, 2015b).

In July 2014, it was announced that the company building the steel-producing complex had started forming its initial capital. The State Committee on Securities of Azerbaijan registered an emission prospectus of the ZAO Azerbaijani Steel Producing Complex (ASPC) for a total of 2 million manats (about $2.5 million). The initial distribution of the shares would be conducted privately. ASPC was working on the initial stages of the project, including preparing blueprints and construction. The new complex was to become a full-cycle enterprise covering all stages of steel production, from mining iron ore to producing steel products. To stimulate construction of the complex, the Government reduced the value added tax rate for all materials and equipment needed for the complex to zero. The new rate would go into effect on March 10, 2015 (Kurbanova, 2014; Hasanli, 2015b).

Industrial Minerals

Iodine.—In 2014, Azerbaijan produced 221,100 t of iodine, which was an 11.2% decrease compared with production in 2013. The only iodine producer in the country was OOO "Azer-Yod," which was a subsidiary of ISR Holding Group. In 2005, OAO Neftchala Yod-Brom was privatized and started modernization. In 2007, the new plant opened the first stage of production; at the time, the only product of the plant was iodine. In December 2008, ISR Holding Group received a $15 million loan for further modernization of the plant. The company bought a new production line in Ukraine and intended to increase the plant's annual capacity to between 400 t/yr and 500 t/yr. It also planned to repair its current wells (about 80), drill 140 additional wells, and install a new gas-powered generator. After the renovation was completed, the company would be able to produce iron bromide and salt (Azertag.az, 2007; Azerizv.az, 2010).

Since 1994, the plant had extracted iodine using the air desorption method. At the Neftchala deposit, this method was used in cold water, without the use of acids, and the iodine extraction rate was about 94%. At the current production rate, it was expected that the resources of the Neftchala deposit would be sufficient to continue producing iodine for another 25 years (Azertag.az, 2007; Contact.az, 2014b).

Mineral Fuels

Natural Gas.—In 2014, Azerbaijan produced and sold 18,727 million cubic meters of natural gas, which was an increase of 4.7% compared with the output in 2013. As of January 2014 (the latest year for which information was available), according to the U.S. Energy Information Administration, which referenced the Oil and Gas Journal, Azerbaijan's gas reserves were approximately 990 billion cubic meters. Almost all Azerbaijan's gas was produced in two offshore fields—the ACG complex and the Shah-Deniz field (AnalitikaUA.net, 2014; U.S. Energy Information Administration, 2014; Yusubov, 2014).

Petroleum.—In 2014, crude oil production in Azerbaijan decreased to 41.9 Mt, or by 2.9% compared with that of 2013.

Petroleum production volumes in Azerbaijan had been decreasing since 2010, when the country produced 50.8 million metric tons (Mt). The Organization of the Petroleum Exporting Countries (OPEC) forecasted that Azerbaijan's oil production volumes were likely to continue to decrease. The Government, on the other hand, projected future production growth from new offshore deposits, which were being developed under international contracts. The major source of crude oil in the country was the ACG field, which had been in operation for more than 15 years. The ACG field is located about 100 km east of Baku in the Caspian Sea and covers 430 square kilometers. The ACG field had an estimated 5 billion barrels of reserves; it produced mostly Azeri Light, which is a medium-light and sweet crude that is valued for its middle-distillate yield. The ACG petroleum project was developed by a consortium of companies lead by BP p.l.c. of the United Kingdom, which had a 35.78% share in the project. Other participants included SOCAR (11.65%), Chevron Corp. of the United States (11.27%), INPEX Corp. of Japan (10.96%), Statoil of Norway (8.56%), Exxon Mobil Corp. of the United States (8.01%), Turkiye Petrolleri Anonim Ortakligi (TPAO) of Turkey (6.75%), Itochu Corp. of Japan (4.3%), and Hess Corp. of the United States (2.72%) (Alizade, 2014; AnalitikaUA,net, 2014; Report.az, 2014; U.S. Energy Information Administration, 2014).

Azeri crude oil was refined domestically at two refineries—the Azerneftyag refinery (which specialized on dark refinery products) and the Heydar Aliyev refinery (which produced light refinery products), both of which were owned by SOCAR. The combined refining capacity of the refineries was about 400,000 barrels per day [about 22 million metric tons per year (Mt/yr)], but the actual production was much lower. In 2014, the refineries increased production by about 4.8% compared with that of 2013 (U.S. Energy Information Administration, 2014; News.day.az, 2015).

SOCAR planned to build a new petroleum refinery that was part of an ambitious project to construct an integrated complex for refining oil and gas and producing chemical products. The Oil and Gas Production Complex (OGPC) was expected to be commissioned in 2030. Prior to that, SOCAR planned to modernize the Heydar Aliyev refinery and to build seven or eight refining installations to extend its lifetime. According to the plan, the OGPC refinery would have the capacity to refine up to 9 Mt/yr of petroleum and would produce gasoline, diesel, and jet fuel. The other components of OGPC—a natural gas refinery and a petrochemical complex—were expected to be commissioned in 2020. The total cost of the first stage of the project (natural gas refinery and petrochemical complex) was estimated at $8.45 billion and the cost of the OGPC refinery would be another $6.1 billion. At the beginning of 2014, the State Committee on Standards and Patents was planning to approve national standards for OGPC. It was anticipated that about 50 new standards would be used in the construction and operation of the complex (Mustafaeva, 2014; Rupec.ru, 2014; Taneco.ru, 2014).

Outlook

In 2014, Azerbaijan continued to focus its on oil and gas production, but also made efforts to reinvest the proceeds from exporting hydrocarbons into other economic sectors, such as ferrous and nonferrous metallurgy. Azerbaijan also invested resources in building petroleum processing and petroleum transportation facilities, both domestically and abroad, but many of these investments will take 5 or more years to complete.

In the next few years, it is likely that oil production will decrease. Natural gas production, on the other hand, has the potential to double over the next 10 years. Gold and copper production is likely to increase when the Gedabek and the Gosha Mines reach their production capacities, and some other polymetallic deposits may be developed.

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TABLE 1
AZERBAIJAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Alumina		--	6,200	101,800	--	--
Aluminum, primary and secondary		--	20,000 [e]	54,890	53,290	50,357
Copper ore, metal content		184	611	502	329 [r]	772
Gold	kilograms	1,900	1,775	1,563	1,619	1,873
Iron and steel						
Iron ore, marketable:						
Gross weight		57,800	214,300	207,300	141,400	91,400
Fe content[e]		32,900	103,000	99,300	67,700	43,800
Steel:						
Crude		128,600	234,000	267,700	222,800	288,136
Pipe		36,545	98,500	61,773	60,785	35,883
Rebar		--	--	--	244,320	250,822
Silver	kilograms	1,500	1,217	626	630 [r]	239
INDUSTRIAL MINERALS						
Bentonite		18,073	20,700	157,875 [r]	91,958 [r]	76,512
Bromine[e]		3,500	3,500	3,500	3,500	NA
Caustic soda		6,220	9,800	300	--	--
Cement		1,278,800	1,425,000	1,966,000	2,296,100	2,867,000
Gypsum		49,200	100,800	149,984	170,001 [r]	112,972
Iodine	kilograms	300,000 [e]	350,000 [e]	240,400	249,100	221,100
Lime, construction		802	2,229	16,894	10,662	20,000 [e]
Limestone		1,173,863	1,200,000 [e]	1,696,977	1,013,531	657,609
Salt, marketable		4,449	5,128	5,345	4,855 [r]	5,165
Sand, construction		1,178,000	1,335,200	2,211,200	2,138,600	2,150,000 [e]
Sulfuric acid		10,100	15,500	4,300	200	--
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	million cubic meters	16,673	16,361 [2]	17,242	17,895	18,727
Petroleum:						
Crude:						
In gravimetric units		50,838,000	45,626,000	42,982,000	43,163,000	41,893,000
In volumetric units	42-gallon barrels	352,000,000	331,610,000 [3]	320,667,000 [3]	313,700,000	304,600,000
Refinery products:						
In gravimetric units		6,169,600	5,150,000 [e]	4,800,000	5,088,000	5,330,000 [e]
In volumetric units	42-gallon barrels	52,688,000	43,981,000	40,992,000	43,500,000	45,600,000 [e]

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. NA Not available. -- Zero.

[1] Table includes data available through September 1, 2015.

[2] Only natural gas sold as a commodity; includes associated gas.

[3] Only marketable crude petroleum; includes gas condensate.

TABLE 2

AZERBAIJAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Locations or deposit names	Annual capacity[e]
Alumina		Ganja refinery	Ganja	450,000
Aluminum		OJSC Azerbaijan Aluminum [Azeraluminum (Azeral)] (Det.Al Aluminum Holding)	Sumqayit	60,000
Do.		OJSC Azerbaijan Aluminum [Azeraluminum (Azeral)] (Det.Al Aluminum Holding)	Ganja smelter	50,000
Alunite ore		Zaglik alunite mining directorate	Zaylik, Dashkasan region	600,000
Cement		NA	Plants in Karadagly and Tavuzcay region	2,000,000 [2]
Clays, bentonite		NA	Dash-Salakhlinskoye deposit	100,000
Copper ore		Anglo Asian Mining PLC [R.V. Investment Group Services, 51%, and Government, 49%]	Gedabek and Gosha Mines	NA
Gold	kilograms	Anglo Asian Mining PLC [R.V. Investment Group Services, 51%, and Government, 49%]	Gedabek and Gosha Mines and plant at Gedabek	2,000
Do.		Azerbaijan International Mineral Resources Operating Co. (AIMROC)	Chovdar deposit, near Ganja	NA
Iodine		OOO Azer-Yod	Plant in Neftchala	NA
Iron ore, marketable, Fe content		OAO Daskesan Filizsaflashdirma	Dashkasan region	70,000
Lime		AAC Co.	Plant in Baku region	65,000
Natural gas, processing		NA	Plant in Karadagly region	NA
Petroleum and natural gas:				
Crude petroleum and gas condensate		Azerbaijan International Operating Co., (AIOC) in conjunction with BP p.l.c., Chevron Corp., State Oil Company of Azerbaijan Republic (SOCAR), Total S.A., Inpex Corp., Statoil ASA, Exxon Mobil Corp., Türkiye Petrolleri A.O. (TPAO), Itochu Corp., Devon Energy Corp., and Delta Hess (joint venture of Delta Oil and Hess Corp.)	Azeri-Chirag-Guneshli (ACG) offshore oilfields in the Caspian Sea	55,000,000
Natural gas	billion cubic meters	International consortium consisting of BP p.l.c., Statoil ASA, OAO Lukoil, Oil Industries' Engineering and Construction (OIEC), State Oil Company of Azerbaijan Republic (SOCAR), Total S.A., and Türkiye Petrolleri A.O. (TPAO)	Shah-Deniz gas condensate field	10
Petroleum, refined		NA	Azerneftyag refinery in Baku	12,000,000 [3]
Do.		NA	Heydar Aliyev Baku refinery	10,000,000 [3]
Salt (rock salt)		NA	Hehram and Pusyan deposits, Naxcivan region	2,500,000
Steel:				
Crude		OOO Baku Steel Co.	Baku	400,000
Pipe, tubes		OAO Azerboru	Sumqayit	400,000
Ingots		Baku Steel Casting	Baku	NA

[e] Estimated. Do. Ditto. NA Not available.

[1] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2] Capacity estimates are totals for all enterprises that produce cement.

[3] Capacity for crude petroleum distillation.

THE MINERAL INDUSTRY OF BELARUS

By Elena Safirova

Belarus's mineral production enterprises included a potash mining company, three steel plants, a nitrogen production enterprise, and two crude oil refineries. Belarus was the third-ranked country among the world's potash producers, following Canada and Russia (Jasinski, 2016). The country's only mineral production enterprise that played a major role in world markets was its potash mining firm OAO Belaruskali. Although Belarus does not have significant sources of fuel minerals, it had oil pipelines, gas pipelines, and two large petroleum refineries that positioned the country as an important player in the transportation of oil and natural gas to Europe from Russia (Safirova, 2012).

Minerals in the National Economy

In 2014, the country's real gross domestic product (GDP) increased by 1.6% compared with that of 2013, and the nominal GDP amounted to $75.9 billion.[1] The industrial production of Belarus contributed 26.9% to the country's GDP, and the mineral sector accounted for 1.5% of industrial production. The total value of industrial production increased by 1.9% compared with that of 2013. In 2014, the value of mineral industry output increased by 41.7% compared with that of 2013; the combined value of metallurgical production and products made of metal decreased by 1.2%, and the value of nonmetal mineral products decreased by 3.6% (National Statistical Committee of the Republic of Belarus, 2015).

The total value of foreign direct investment (FDI) in Belarus's economy in 2014 was $10.2 billion, which was an 8.2% decrease compared with FDI in 2013. The mineral sector received only 1.4% of total foreign investment. Russia provided 50.3% of the total FDI and was the main source of foreign investment in 2014 (National Statistical Committee of the Republic of Belarus, 2015).

In 2014, Belarus exported $43.6 billion worth of goods and services, which was a 1.1% decrease compared with the total export revenue in 2013. Belarus also imported $43.9 billion worth of goods and services, which was a 5.3% reduction compared with the value of imports in 2013. In 2014, Belarus exported 13.8 million metric tons (Mt) of refined petroleum products, 5.7 Mt of potash (in K_2O equivalent), and 1.9 Mt of ferrous metals. The major export partner of Belarus was Russia, which received 42.2% of all exports, by value, followed by Ukraine (11.2%), the United Kingdom (8.2%), the Netherlands (4.8%), Germany (4.5%), Lithuania (2.9%), Italy (2.8%), Kazakhstan (2.4%), Poland (2.3%), and Brazil (2.0%). The main import categories were (in order of decreasing value) mineral products (including petroleum and natural gas), equipment and machinery, chemicals, metals, and agricultural products and food. The major import partner of Belarus by far was Russia, which supplied 54.6% of goods and services, by value. Other significant import partners were Germany (6.0%), China (5.8%), Ukraine (4.1%), Poland (3.8%), and Italy (2.9%) (National Statistical Committee of the Republic of Belarus, 2015).

Production

In 2014, potash production in Belarus increased by 49% to about 6.3 Mt in K_2O equivalent. Output of steel cord, which was used in tire production, increased by 12.4% to 80,700 metric tons (t), cement production increased by 11.1% to about 5.6 Mt, and nitrogen production increased by almost 10% to 1.0 Mt. Rolled and crude steel output increased by 9.4% to 2.3 Mt and by 8.4% to 2.6 Mt, respectively. The volume of refined petroleum production increased by about 5.5% to 22.3 Mt. At the same time, Belarus sharply reduced its peat production; the output decreased by 34% to 1,604 Mt. The output of steel pipes decreased by 17% to 201,300 t, and gypsum production decreased by 9.7% to 64,000 t. Other production data are in table 1.

Structure of the Mineral Industry

Most of the mineral industry enterprises were consolidated under the State Concern for Oil and Chemistry, known as Belneftekhim. Belneftekhim included Belaruskali, which was one of the leading potash producers in the world; OAO Grodno Azot, which specialized in the production of ammonia, nitrogenous fertilizers, and sulfuric acid; two oil refineries (OAO Naftan and OAO Mozyr NPZ), which together had a total annual throughput capacity of 22 Mt; and almost 50 other enterprises operating in the petrochemical industry. Belarus had adopted an industry privatization plan and created a list of enterprises that could be privatized. The list included only smaller production facilities, however, and excluded all enterprises of national significance in terms of contribution to Belarus's GDP (Romanchuk, 2011).

Commodity Review

Metals

Iron and Steel.—The OAO Byelorussian Steel Works (BMZ) was the predominant producer of iron and steel in Belarus. In 2014, BMZ produced 2.5 Mt of crude steel and about 2.1 Mt of rolled steel; 125,200 t of steel pipe, and 80,700 t of steel cord. Compared with 2013, production of crude steel, rolled steel, and steel cord increased in 2014, and steel pipe output decreased slightly. In July 2014, the company achieved a new monthly production record for crude steel; which became possible because of several modernization projects that were completed in 2013 (OAO Byelorussian Steel Works, 2015).

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[1] Where necessary, values have been converted from Belarusian rubles (BYR) to U.S. dollars (US$) at an annual average exchange rate of BYR10,260.18=US$1.00 for 2014.

By the end of 2013, BMZ completed two new investment projects at a total cost of $23 million. Both projects were a part of the BMZ modernization program, the goals of which were to increase steel production at the plant to 3 million metric tons per year (Mt/yr) and to increase production efficiency. The first project was the modernization of one of the BMZ's electric arc furnaces, which increased the annual production capacity of the furnace to 1 Mt/yr and simultaneously reduced production costs by $5.25 per ton of steel. The other two furnaces were renovated earlier. The second project was the installation of a new sleeve-type filtration system that would help reduce the amount of fuel needed to run the furnace, reduce the emissions of fine particles into the atmosphere, and increase the energy efficiency of the production process (Belta.by, 2014a).

In 2014, BMZ continued its modernization efforts. In February, it started operating a reconstructed steel casting machine and a new lime firing unit. The new steel casting machine cost 27 million euros (about $34.4 million) and increased the speed of casting from 3.1 meters per minute to 4.3 meters per minute. The new lime unit cost 26 million euros (about $33.2 million) and was essentially a lime production plant with a production capacity of 400 metric tons per day. By January 2015, BMZ was planning to complete modernization of its rolling mill and reconstruction of the jobbing and rolling unit. Overall, the entire modernization program, which began in 2011 and was expected to continue through 2015, included 10 large projects at a total cost of 520 million euros (about $663.3 million) (Metalbulletin.ru, 2014; Minprom.ua, 2014).

Others producing steel in Belarus were the OJSC Rechitsa Metizny plant and the OAO Mogilev Metallurgical Works. Minsk Motor Works (MMZ), which was the only producer of diesel engines in Belarus, started construction of a new plant that would produce cast iron, primarily for internal company consumption. The total cost of the project was expected to be $175 million, including $47.6 million for the cost of construction. After completion of the first stage of the project in 2014, the capacity of the new plant was expected to be 8,000 metric tons per year (t/yr) of cast iron. The second production stage, which was expected to start in 2015, would result in another production line with the capacity to produce 18,000 t/yr of pig iron. When the third stage is complete in 2017, the plant's capacity would reach 50,000 t/yr of cast iron. When completed, the pig iron plant would satisfy MMZ's needs, and the company would be able to export some of its output (Interfax.by, 2012; Belta.by, 2014b, 2015).

Kasi metallurgical company of the Czech Republic was planning to build a new plant in Belarus in the city of Krichev. Kasi was planning to invest 120 million korunas (about $5.78 million) in a joint project with the Krichev cement plant. The new plant would produce rebar, reinforced concrete panels for construction, and equipment for sewer systems. Company officials stated that the primary reason for expanding production into Belarus was the high green energy taxes in the Czech Republic, which were significantly reducing the profitability of the three existing plants. The new plant was expected to employ 60 workers. In 2014, Kasi was exporting its product to the countries of the European Union (EU), Russia, and Ukraine (Chekanova, 2014; Marsheva, 2014).

Industrial Minerals

Potash.—OAO Belaruskali was one of the world's leading producers of potash fertilizers, and, historically, potash was the leading export product from Belarus. The company was mining the Starobin potash deposit, which contains magnesium salt, rock salt, and sylvinite. In 2013, Belaruskali's production and sales were greatly reduced because of a dispute with its former sales partner, OAO Uralkali of Russia. In 2014, however, Belaruskali's production bounced back and reached about 6.3 Mt of potash (in K_2O equivalent) (OAO Belaruskali, 2015).

In August, Belaruskali began construction of a new potash mining complex in Belarus, Petrikovskiy GOK, at a new potash deposit located southeast of the Starobin deposit. The forecast resources of the deposit were estimated to be 2,200 Mt, and the depth of the mineralization was down to 1,200 meters (m). The planned development included construction of two mines with shaft diameters of 8 m and depths of 800 m. The sinking of the first 275 m of the shaft was expected to require a ground-freezing technology. An area would be reserved for the construction of a third mine if needed at a later stage. In addition to the mines, construction would include processing units and infrastructure, including highways, a railroad, electric lines, and a high-pressure gas pipeline. Belaruskali planned to finance construction of the Petrikovskiy GOK with its own funds. According to the project plans, the first stage of the Petrokovskiy GOK would be completed in December 2019 and would reach full capacity by December 2021 (OAO Belaruskali, 2014a, b).

In September 2013, in the midst of the dispute between Belarus and Russia that resulted in a potash crisis in Belarus that made it difficult for Belaruskali to export potash, the Government of Belarus temporarily eliminated export tariffs on potash through the end of 2013 in order to support Belaruskali. The Government maintained this tariff policy throughout 2014, and at yearend 2014, the Government established the potash export tariff in the amount of 45 euros (EUR) per metric ton (about $57.40 per metric ton). Prior to 2014, the potash tariffs ranged from EUR75 and EUR85 per metric ton (between $95.70 and $108.40 per metric ton) (RIANovosti, 2015).

Mineral Fuels

Petroleum and Natural Gas.—Belarus had two petroleum refineries—OAO Mozyr NPZ and OAO Naftan—with the combined capacity to process about 22 Mt/yr of crude oil. In 2014, the two refineries processed 22.3 Mt of petroleum and produced 8.0 Mt of diesel fuel, 5.9 Mt of oil fuel, and 3.9 Mt of gasoline. In 2014, Belarus imported 22.4 Mt of petroleum from Russia and 104,700 t from Kazakhstan. During the next few years, the country planned to increase the combined capacity of its refineries to 24 Mt/yr and to increase the effectiveness of the refineries; that is, to increase the production of light petroleum products, such as gasoline, and to reduce output of oil fuel. As of 2014, the rate of refining effectiveness in Belarus's refineries was about 72%, whereas the Government's target was at least 90% (Naviny.by, 2015).

The decrease in global petroleum prices led to lower profit margins for Belarus's refineries and made modernization efforts to increase refining effectiveness more urgent. From 2010 through 2014, Mozyr NPZ implemented eight large investment projects, which included hydrodesulfurization of gasoline, hydrogen production, and hydropurification of diesel fuel, at a total cost of $800 million. The key element of the modernization program was the construction of a production complex for hydrocracking of heavy oil fractions, which would cost $1,476 million. Naftan also had a modernization program, with a total cost of about $2 billion. Some of the projects, such as the unit for slow coking, were financed from the company's own funds. Others, such as the hydropurification projects,were being financed by Belarusbank. An expansion of the hydrocracking unit was being financed by a consortium of foreign banks. Most modernization projects were expected to be completed by 2017 (Manenok, 2014, 2015).

Outlook

Belarus is expected to continue to be a major supplier of potash to world markets, and it is trying to modernize its steel and petroleum refining industries to increase its competitive advantage and efficiency. In the previous years, the Government considered divesting some of its leading enterprises. Although Belarus did not sell any of its flagship state enterprises in 2014, it could still decide to sell some of them, such as Belaruskali, BMZ, Grodno Azot, and the Mozyr NPZ and Naftan refineries, in the future, depending on the country's financial situation. If some of these facilities are privatized, the direction of enterprise development may be affected. The future of Belarus' economy in general and the minerals sector in particular is likely to depend on political relations with Russia and on the country's ability to develop and maintain a reliable global business network (Manenok, 2012; 2013).

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TABLE 1
BELARUS: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Steel:						
Crude		2,672	2,779	2,869	2,395	2,597
Rolled		2,458	2,457	2,599	2,159	2,361
Pipe	metric tons	183,700	224,500	245,700	242,500	201,300
Cord	do.	92,900	94,100	87,900	71,800	80,700
INDUSTRIAL MINERALS						
Cement		4,531	4,604	4,906	5,057	5,618
Gypsum		68	66	69	71	64
Lime		804	794	747	748	769
Nitrogen, N content of ammonia	metric tons	890,900	927,300	949,600	967,400	1,063,600
Potash, K_2O equivalent		5,223	5,306	4,840	4,243	6,306
Salt[3]	metric tons	2,411,600	2,576,300	2,176,600	2,625,300	2,510,000 [e]
Sulfuric acid		891	900 [e]	777	710	700 [e]
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	million cubic meters	213	222	218	228	222
Peat:						
Horticultural use		241	422	267	164	115
Fuel use		2,352	2,704	2,679	2,269	1,489
Total		2,593	3,126	2,946	2,433	1,604
Petroleum:						
Crude:						
In gravimetric units		1,700	1,682	1,660	1,645	1,645
In volumetric units	42-gallon barrels	12,500	12,400	12,200	12,100	12,100
Refined:						
In gravimetric units		16,455	20,474	21,668	21,156	22,300
In volumetric units	42-gallon barrels	131,600	163,800	173,300	169,200	178,400

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. do. Ditto.

[1] Table includes data available through July 2, 2015.

[2] In addition to the commodities listed, dolomite and synthetic diamond may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Includes byproduct salt from potash production.

TABLE 2
BELARUS: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity^e
Cement	OAO Krasnoselskstroymaterialy	Hrodzyenskaya Voblasts'	2,700,000
Do.	OAO Krichevtsementnoshifer	Mahylyowskaya Voblasts'	1,800,000
Do.	OAO Belarusian Cement Plant (BCZ)	do.	2,900,000
Diamond	Gomel Production Association Kristall	Homyel'skaya Voblasts'	NA
Lime	OAO Belarusian Steel Works (BMZ) [Belarusian Metallurgical Co. Holding (Government of Belarus, 100%)]	Zhlobin, Homyel'skaya Voblasts'	150,000
Nitrogen	OAO Grodno Azot (Belneftekhim)	Hrodzyenskaya Voblasts'	1,100,000 [1]
Peat, fuel use	Production at 31 enterprises that produce mainly briquets	All regions of the country	5,000,000 [2]
Petroleum:			
Crude	NGDU Rechitsaneft (Belneftekhim)	Rechitskoye, Ostashkovichskoye, Vishanskoye, Tishkovskoye, and Yuzhno-Ostashkovichskoye deposits, southeastern part of the country	2,000,000
Refined	OAO Mozyr NPZ (Government, 42.76%; Slavneft, 42.58%; MNPZ Plyus, 12.25%)	Homyel'skaya Voblasts'	10,000,000 [3]
Do.	OAO Naftan (Novopolotsk NPZ)	Vitsyebskaya Voblasts'	12,000,000 [3]
Potash, K_2O equivalent	OAO Belaruskali (Belneftekhim)	Starobin deposit, Minskaya Voblasts'	6,300,000
Steel:			
Crude	OAO Byelorussian Steel Works (BMZ) [Belarusian Metallurgical Co. Holding (Government of Belarus, 100%)]	Zhlobin, Homyel'skaya Voblasts'	2,700,000
Pipe	do.	do.	250,000
Rolled	do.	do.	2,300,000
Do.	OAO Mogilev Metallurgical Works (MMZ) {OAO Byelorussian Steel Works (BMZ) [Belarusian Metallurgical Co. Holding (Government of Belarus, 100%)]}	Mahylyowskaya Voblasts'	120,000
Do.	OJSC Rechitsa Metizny Plant (RMZ) [Belarusian Metallurgical Co. Holding (Government of Belarus, 100%)]	Homyel'skaya Voblasts'	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] N content of ammonia.

[2] Total peat for fuel use.

[3] Crude throughput.

THE MINERAL INDUSTRIES OF BELGIUM AND LUXEMBOURG

By Alberto Alexander Perez

BELGIUM

In 2014, Belgium was a significant processor of minerals in the European Union (EU), producing cobalt, primary and secondary copper, lead, pig iron, steel, and zinc. Belgium also produced industrial minerals and petroleum refinery products. The city of Antwerp was the leading trading center for the diamond industry in the world (table 1).

Belgium's economy depended considerably on trade, both for domestic consumption and for exporting goods and services from its industry. In 2014, Belgium received 3.5% of all imports of mineral fuels, lubricants, and related materials from the EU, and it accounted for 12.6% of all exports to countries outside of the EU. Belgium also accounted for 7.6% of imports and 5.6% of exports of raw materials from the EU. In 2014, Belgium traded mostly with its EU partners, as 75.9% of all Belgium's exports went to EU members and 72.2% of its imports came from EU members. In 2014, trade between Belgium and the United States amounted to $20.9 billion in imports and $34.8 billion in exports, principally as chemicals, machinery, miscellaneous manufactured goods, petroleum and coal products, and transportation equipment (European Commission, 2015a–e; U.S. Census Bureau, 2015).

Minerals in the National Economy

The metal-processing industries, and in particular steel production, were significant to the Belgian economy. Belgium was the 22d-ranked steel producer in the world in 2013, measured by tonnage of production (World Steel Association, 2014, p. 9).

Umicore Group, which was one of Europe's leading metal recyclers and processors, was headquartered in Brussels, Belgium. Nyrstar N.V., which was headquartered in Balen, Belgium, was a leading producer of zinc, by tonnage of output, in the world (Umicore Group, 2013; Nyrstar N.V., 2015, p. 81).

According to the Antwerp World Diamond Centre, Antwerp was the center of the world's open rough diamond market; 84% of all rough diamond and 50% of all polished diamond pass through Antwerp. Diamond represented 5% of all Belgium's exports worldwide and 15% of all Belgium's exports outside the EU in 2014 (Antwerp World Diamond Centre, 2015).

According to the Environment, Nature and Energy Department of the Flemish region, Flanders produces principally industrial minerals, such as clay, loam, and sand and gravel, and these industrial minerals are the only mineral resources that are exploited and commercialized in the Flemish region. The mineral extraction industry in Flanders directly employed about 3,500 people (Flemish Department of Environment, Nature and Energy, 2014).

Government Policies and Programs

Belgium is a Federal state with a Federal legislature, divided into three linguistic communities, and three geographic regions, all with their respective legislatures. Flanders is the sole exception within this legal framework where the two levels of government (the Flemish language community and the Flemish region legislature) united in 1980. After 1980, the general laws regarding mineral exploitation and administration have been administered under the legislative powers of each region. These regions are Flanders (Vlaanderen), Wallonia (Wallonie), and the Brussels-Capital Region. The main mining law dates from 1810 with modifications in 1914, 1920, and 1929. In 1980, each region became responsible for its own mineral resources, and each region has its own laws and regulations regarding concessions, exploitation, and all matters related to mineral exploitation and extraction (European Union Committee of the Regions, 2014; Service Géologique de Wallonie, 2014).

Production

In 2014, Belgium's production of cobalt increased by 8%, total production of crude steel (4%), total production of zinc (3%), and secondary lead production (2%). Belgium's production of secondary smelter copper decreased in 2014 by 2%, refined primary and secondary copper decreased by less than 1%, and the production of pig iron remained about the same. Belgium mined only industrial minerals. The refining of copper and such minor metals as cadmium, cobalt, germanium, selenium, tellurium, tin, and zinc, and the production of steel were the leading mineral industries in Belgium (table 1).

Structure of the Mineral Industry

Belgium had cement plants, petroleum refineries, and steel mills, making Belgium a significant processor of raw mineral materials. Although the country's industrial production had shifted from manufactured goods to a service economy, mineral processing and manufacturing remained relevant to the Belgian economy.

The principal mining and mineral-processing facilities in Belgium, with their locations and capacities, are listed in table 2. Most facilities were privately owned, either by Belgian companies or other EU companies. Of these companies, Umicore and Nyrstar, in terms of the value of production, were the most prominent. Umicore had a catalysis division, an energy materials division, a performance materials division, and a recycling division. Nyrstar operated the Balen/Overpelt smelter and zinc alloy facility. Nyrstar also owned smelters in Auby, France; Budel, Netherlands; Clarksville, Tennessee; and Hobart and Port Pirie, Australia (Umicore Group, 2013; Nyrstar N.V., 2015).

Commodity Review

Metals

Cobalt.—N.V. Umicore S.A. increased its cobalt production in 2014 to 5,850 metric tons (t) from 5,415 t in 2013, according to the Cobalt Development Institute (CDI). The increase followed a trend of worldwide cobalt production increases. World consumption seemed to have increased by 8% compared with that of the previous year, however, the CDI reported the increase in consumption in China and Asia was more than 10% (Cobalt Development Institute, 2015).

Zinc.—In 2014, Nyrstar N.V. reported that the Balen/Overpelt smelter had increased zinc metal production by 4% to 262,000 t compared with that of the previous year, despite the fact that it had halted production for planned maintenance of its F4 roaster and acid plant in the second quarter of 2014. The company also reported that these operations were both completed in the expected timeframe and within budget (Nyrstar N.V., 2015, p. 24).

Industrial Minerals

Cement.—In April, Lafarge S.A. (Lafarge) of France announced its merger with Holcim S.A. of Switzerland, a project that was expected to be finalized in the first half of 2015. In December, Lafarge announced the composition of the executive committee of the new combined company would be composed of equal numbers of Lafarge and Holcim directors and that its central corporate functions would be distributed in France and Switzerland.

After a strategic optimization of the portfolio through a divestment process, Lafarge announced that while the companies awaited regulatory approvals, the new company, LafargeHolcim, would combine operations, and that its production sites would be located in 90 countries across all continents. Lafarge also stated that no country would account for more than 10% of the combined revenues of the newly created company. Lafarge declared that LafargeHolcim would be listed on the SIX stock exchange in Zurich and the Euronext exchange in Paris; however, the new entity would be domiciled in Switzerland and would operate under the Swiss local governance rules. Prior to the merger, the Holcim Group owned and operated the cement plant in Obourg, Belgium, which had a capacity of 2.2 million metric tons per year (Mt/yr) (LaFarge S.A., 2014a, b).

Italcementi S.p.A of Italy announced in June that it would purchase the remaining stock from Société des Ciments Français, and would absorb the company completely and delist it from the Euronext stock exchange in Paris. On July 15, Société des Ciments Français was officially delisted and incorporated into Italcementi. The company announced that it was exploring its options as the cement industry seemed to be consolidating. Italcementi was the fourth-ranked producer of cement in the world after LafargeHolcim, and it owned and operated several plants in Belgium, including those in Ghent, Hermignies, Lixhe, and Mons, which had a combined capacity of 4.4 Mt/yr (Les Echos, 2014a, b).

Diamond.—In 2014, the net trade of rough diamond in Belgium increased by 10%, and that of polished diamond increased by 4%, for a total (combined) trade value of $58.8 billion, which surpassed the previous all-time record high of $56.5 billion in 2011. In 2014, Antwerp's most active trading partners of polished diamond exports, measured in carats, were Hong Kong, the United Arab Emirates, and the United States. In terms of value, the leading export partners were the United States, Hong Kong, and Israel (Antwerp World Diamond Centre, 2015).

Outlook

Belgium will continue to be a leading mineral processor and major diamond trader. Although it is likely that production of some commodities, such as steel, could decrease as demand diminishes in the world markets, it is also likely that production of other commodities, such as cobalt and zinc, could increase as the demand for these commodities increases. Belgium is also expected to remain important in international and intra-European cargo handling of mineral products through its major ports of Antwerp, Ghent, Ostend, and Zeebrugge.

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LUXEMBOURG

In 2014, the iron and steel industry was Luxembourg's most economically important mineral industry sector, and steel was the country's main export commodity.

Production

Mining in Luxembourg consisted of small industrial mineral operations that produced mineral commodities only for domestic consumption. These minerals included dolomite, limestone, sand and gravel, and slate. Information on these operations was not readily available. Some commodity production data are in table 1.

Structure of the Mineral Industry

The principal mineral facilities in Luxembourg, with their locations and capacities, are listed in table 2. Most facilities were privately owned.

Commodity Review

Metals

Iron and Steel.—ArcelorMittal, which was headquartered in Luxembourg, was the world's leading steel manufacturer. It was more than two times larger, in terms of volume, than its main competitor, Hebei Group of China (World Steel Association, 2014, p. 8).

Industrial Minerals

Cement.—In 2014, Buzzi Unicem S.p.A., the parent company of Cimalux S.A., reported that investments in the construction sector had begun to recover, when compared with those of the previous year, and that domestic cement consumption was increasing. In 2014, the company reported that its production had decreased by 1.6% compared with that of 2013, and its average unit revenues were marginally lower than the previous year. The company also reported that ready-mix concrete production posted a decrease of 6.6% in 2014 and that net production decreased by 3.2% from the previous year (Buzzi Unicem S.p.A, 2015, p. 14).

Outlook

Luxembourg is expected to continue to be a producer and exporter of steel. The country's industrial mineral production will likely continue to be limited to domestic consumption.

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TABLE 1
BELGIUM AND LUXEMBOURG: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity		2010	2011	2012	2013	2014
BELGIUM[2]						
Metals:						
Cobalt, primary[3]		2,600 [e]	3,187	4,200	5,415	5,850
Copper:						
Smelter, secondary		118,600	112,900	118,000	150,600 [r]	148,000 [e]
Refined, primary and secondary		381,000	394,200	396,000	387,000 [r]	385,000 [e]
Iron and steel:						
Pig iron	thousand metric tons	4,688	4,725	4,072	4,343	4,335
Steel:						
Crude	do.	7,973	8,026	7,386	7,092	7,345
Hot-rolled products	do.	9,649	10,012	8,917	8,293 [r]	8,300 [r]
Lead, refined, secondary		121,000 [r]	119,000 [r]	119,000 [r]	129,000 [r]	132,000 [e]
Zinc:						
Slab:						
Primary		260,000	282,000	250,000	252,000 [r, 4]	262,000
Secondary, possibly remelted zinc[e]		51,000 [r]	50,000 [r]	47,000 [r]	48,000 [r]	48,000
Total		311,000	332,000	290,000	292,000	310,000
Industrial minerals:						
Cement	thousand metric tons	6,095	6,954	6,280	6,119 [r]	6,100 [e]
Mineral fuels and related materials:						
Coke, all types	do.	2,133	2,120	2,100	2,100	2,100
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	6,205	6,200	5,439	6,680 [r]	6,600 [e]
Naphtha and white spirit	do.	14,300	NA	NA	NA	NA [e]
Gasoline	do.	30,186	30,100	27,558	34,602 [r]	34,600 [e]
Kerosene	do.	15,950	15,900	13,870	11,790 [r]	11,700 [e]
Kerosene, other	do.	511	510	511	256 [r]	250 [e]
Distillate fuel oil	do.	93,075	93,000	98,477	82,855 [r]	82,800 [e]
Refinery gas	do.	3,800	NA	NA	NA	NA [e]
Residual fuel oil	do.	35,150	35,100	37,449	32,193 [r]	32,100 [e]
Bitumen	do.	8,600	NA	NA	NA	NA [e]
Total	do.	207,777	180,000	183,304	168,376 [r]	168,000
LUXEMBOURG[5]						
Metals:						
Steel:						
Crude	thousand metric tons	2,563	2,521	2,232	2,100 [r]	2,200
Hot-rolled products	do.	1,941	2,220	2,000	2,000	2,100
Industrial minerals:						
Cement, hydraulic[e]		1,078,000	1,319,000 [4]	1,217,000	1,200,000	1,100,000 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available.

[1] Table includes data available through May 11, 2015.

[2] In addition to the commodities listed, Belgium produced a number of other metals, alloys, and industrial minerals, such as aluminum (secondary), bismuth, dead-burned dolomite, kaolin, lime, nitrogen, quicklime, selenium, sodium sulfate, sulfur, sulfuric acid, tin (secondary), worked and natural stone, and zinc powder, but available information was inadequate to make reliable estimates of output.

[3] Production reported by N.V. Umicore S.A. includes production from China and South Africa.

[4] Reported figure.

[5] In addition to the commodities listed, Luxembourg produced phosphates (Thomas slag), for which only aggregate output figures were available.

TABLE 2
BELGIUM AND LUXEMBOURG: STRUCTURE OF THE MINERAL INDUSTRIES IN 2014

(Thousand metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
BELGIUM				
Cadmium, metal	metric tons	N.V. Umicore S.A.	Hoboken	1,800
Cement		Major companies, of which:	Plants, of which:	9,000
Do.		Cimenteries CBR S.A. (HeidelbergCement Group)	Major plants at Lixhe, Mons/Obourg, Harmignies, and Ghent	(4,400)
Do.		Holcim (Belgium) S.A.	Plant at Obourg	(2,200) [1]
Do.		Compagnie des Ciment Belge (Ciments Francais S.A.)	Plant at Gaurain-Ramecroix	(2,400)
Cobalt	metric tons	N.V. Umicore S.A.	Refinery at Olen	500
Copper, secondary		Metallo-Chimique NV (Metallum Group)	Smelter at Beerse	80
Dolomite		SA Dolomeuse (Group Lhoist)	Quarry at Marche les Dames	500
Do.		do.	Plant at Marche les Dames	750
Do.		SA de Marche-les-Dames (Group Lhoist)	Quarries at Nameche	3,000
Do.		do.	Plant at Nameche	3,000
Do.		SA Dolomies de Merlemont (Group Lhoist)	Quarry at Philippeville	100
Lead, metal		N.V. Umicore S.A.	Smelter at Antwerp-Hoboken	90
Do.		do.	Refinery at Antwerp-Hoboken	125
Limestone		Carmeuse S.A. (privately owned)	Mines and plant at Engis	1,850
Do.		do.	Mines and plant at Frasnes	450
Do.		do.	Mines and plant at Maizeret	850
Do.		do.	Mines and plant at Moha	800
Do.		SA Transcar (Royal Volker Stevin)	Mines and plant at Maizeret	850
Petroleum, refined	42-gallon berrels per day	Total S.A.	Refinery at Antwerp	268,000
Do.	do.	ExxonMobil Petroleum & Chemical B.V.B.A. (ExxonMobil Corp., 100%)	do.	239,000
Do.	do.	Antwerp Processing Co. (Vitol Group)	do.	125,000
Do.	do.	Belgian Refining Corp. (Guvnor Group)	do.	107,500
Do.	do.	PRA NV (Vitol Group)	do.	22,300
Salt		Zoutman NV	Plant at Roeselare	200
Sand, silica		SRC-Sibelco SA	Mines and plants at Lommel, Mol, and Maasmechelen	500
Steel:				
Crude		ArcelorMittal Liege (ArcelorMittal)	Plant at Liege	3,000
Do.		ArcelorMittal Gent (ArcelorMittal)	Plant at Ghent	3,000
Do.		NLMK La Louviere S.A. (NLMK Group)	Plant at La Louviere	900
Manufactured		NMLK Clabecq S.A. (NLMK Group)	Rolling mill at Clabecq	750
Do.		Industeel Belgium S.A. (ArcelorMittal)	Rolling mill at Charleroi	600
Do.		ArcelorMittal Genk (ArcelorMittal)	Galvanizing plant at Genk-Zuid	360
Do.		Tubemeuse Industries S.A.	Tube mill at Flemalle	50
Tin		Metallo-Chimique NV (Metallum Group)	Smelter at Beerse	12
Zinc, metal		Nyrstar N.V.	Smelter and refinery at Balen/Overpelt	252
LUXEMBOURG				
Cement		Cimalux S.A. (Buzzi Unicem S.p.A.).	Grinding plant at Esch-sur-Alzette	850
Do.		do.	Clinker plant at Rumelange	1,000
Steel		ArcelorMittal Belval and Differdange S.A. (ArcelorMittal)	Plants at Differdange, Esch-Belval, and Esch-Schifflange	5,320

Do., do. Ditto.

[1] Includes the capacity of the company SA Ciments de Haccourt.

THE MINERAL INDUSTRY OF BOSNIA AND HERZEGOVINA

By Sinan Hastorun

Bosnia and Herzegovina is a mountainous, largely landlocked federation located on the western Balkan Peninsula in southeastern Europe. The country borders the other former Yugoslavian republics of Croatia, Montenegro, and Serbia and has a very narrow strip of land on the Adriatic Sea. Much of the country's territory consists of karst limestone. Despite its relatively small size, Bosnia and Herzegovina has substantial mineral resources; the most significant among these are bauxite, copper, iron ore, lead, lignite, and zinc. The country also has significant hydropower and coal-powered thermal energy potential and prospective petroleum and natural gas resources; it was one of only two exporters of electrical energy among the Balkan countries (Trubelja and Baric, 2011, p. 3–5; United Nations Environment Programme, 2012, p. 56; Foreign Investment Promotion Agency, 2014a, p. 7, 10; U.S. Department of Commerce, 2014, p. 4; Marinkovic and Dzaferovic, 2015, p. 47, 49; U.S. Department of State, 2015, p. 3).

The metal-processing sector, which included both ferrous and nonferrous metals, was the most valuable segment of Bosnia and Herzegovina's mineral industry. The sector was the country's largest exporter of goods by value and had registered a substantial increase in production in recent years. The main mineral outputs of the metal-processing sector were alumina, aluminum, iron, lead, steel, and zinc. The mineral extraction sector was dominated by the mine output of bauxite, coal, copper, iron ore, lead, and zinc. Mineral fuels produced in the country were coke, lignite, and subbituminous coal; coal accounted for most of the domestic energy production. Mineral output also included barite, dimension stone, limestone, salt, and sand and gravel. In the former Yugoslavia, Bosnia and Herzegovina was a major metallurgical center and a major source of asbestos, barite, construction aggregates, gypsum, and salt until Yugoslavia's dissolution in 1989, but none of those mineral commodities were produced on a regionally or globally significant level in 2014 (United Nations Environment Programme, 2012, p. 57–59; Dragnic-Krisovic and Nanu, 2013, p. 3; Foreign Investment Promotion Agency, 2013, p. 6–7; Energy Community, 2014, p. 48; U.S. Department of Commerce, 2014, p. 16).

Minerals in the National Economy

Bosnia and Herzegovina's real gross domestic product (GDP) increased by 1.05% in 2014, which was a lower rate of growth than that of 2013.The nominal GDP in 2014 was $18.3 billion. The slowdown in economic activity was in large part owing to record floods in May that were estimated to have cost the country the equivalent of 15% of the GDP in loss of output; the energy sector was among the sectors that were most negatively affected. Investment and consumption (both private and public) increased, whereas net exports (defined as exports minus imports) decreased (Agency for Statistics of Bosnia and Herzegovina, 2015b, p. 1; International Monetary Fund, 2015, p. 24; World Bank, The, 2015a, p. 2; 2015b).

Mining and quarrying accounted for about 2.0% of the country's GDP in 2014 compared with about 2.2%, revised, in 2013. The mining of coal and lignite made up about 68% of the mining and quarrying sector's total production in terms of value, whereas the mining of metal ores accounted for about 21%. Manufacturing made up about 10.9% of the GDP in 2014, which was unchanged from its share in 2013. The manufacture of base metals accounted for about 15.0% of the manufacturing sector's total output in terms of value; the manufacture of coke and refined petroleum products, 12.9%; and the manufacture of nonmetallic mineral products, 3.8%. The gross value added by mining and quarrying decreased by about 3.5% in real terms, whereas that of manufacturing increased by about 4.1% in 2014 (Agency for Statistics of Bosnia and Herzegovina, 2015b, p. 3; 2015d, p. 2).

In 2014, mining and quarrying output decreased by 2.1% compared with that of 2013. Industrial production increased by 0.1%, and manufacturing output, by 3.8%. Total output of metal ores decreased by 3.9%, and coal and lignite output, by 0.7%. Output of nonmetallic mineral products decreased by 6%, and base metals output, by 1.9%. Output of chemicals and chemical products increased by 12.4%, and coke and refined petroleum products, by 7.3%. Energy production including electricity generation decreased by 6.9% in 2014 compared with that of 2013 (Agency for Statistics of Bosnia and Herzegovina, 2015e, p. 5).

Government Policies and Programs

Each of the three constituent entities of Bosnia and Herzegovina—the Federation of Bosnia and Herzegovina, the Republic of Srpska, and the District of Brcko—formulates and implements its own mineral legislation and relevant regulations. Each of the two main political entities has its own government regulatory agency for mineral- and energy-related activities, including environmental protection—the Federal Ministry of Energy, Mining, and Industry in the Federation of Bosnia and Herzegovina and the Ministry of Industry, Energy, and Mining in the Republic of Srpska (United Nations Environment Programme, 2011, p. 4; 2012, p. 56).

The Federal Ministry of Energy, Mining, and Industry is responsible for drafting mining and energy legislation, enacting regulations for implementation of the laws, and overseeing mineral extraction and processing in the Federation of Bosnia and Herzegovina. Relevant laws governing the mineral industry in the Federation include the Mining Law, No. 26/10 of 2010; the Law on Geological Survey, No. 9/10 of 2010; the Law on Concessions, No. 40/02 of 2002, as amended by law No. 61/06 of 2006; and the Law on Environmental Protection, No. 33/03 of 2003, as amended by law No. 38/09 of 2009. The Ministry of Industry, Energy, and Mining is responsible for overseeing the use of minerals and setting electricity policies in the Republic of Srpska. It regulates the extraction and use of minerals for electricity generation and the production and use of biofuel. Relevant regulations governing the mineral industry in the Republic include the Law on Mining, No. 107/05 of 2005, as amended by law No. 75/10 of 2010; the Law on Energy, No. 49/09 of 2009; and the Law on Concessions, No. 25/02 of 2002, as amended by the laws No. 91/06 of 2006 and No. 92/09 of 2009 (United Nations Environment Programme, 2011, p. 12; 2012, p. 20–24; Federal Ministry of Energy, Mining, and Industry, 2015; United Nations Environment Programme, 2015a; b).

Hydrocarbon exploration and production is governed by the Federation of Bosnia and Herzegovina Law on Research and Exploitation of Oil and Gas of 2013. The country did not have a national strategy regarding energy supply security. There was no development of renewable energy sources either, despite the existence of a national target for energy generation from such sources (European Commission, 2014, p. 48–49; Marinkovic and Dzaferovic, 2015, p. 49).

Production

In 2014, Bosnia and Herzegovina's production of bentonite increased more than fourfold; ecaussine and other calcareous stone (types of monumental or building stone), by about 81%; granite, by 60%; coke, by 21%; pig iron, by 13%; lime and sodium compounds, by 11% each; silicon metal and crude steel, by 10% each; and salt, by 8%. The production of slate decreased by about 87%; crude kaolin, by 52%; marble and travertine, by 45%; construction sand, by 44%; limestone (crushed and powdered), by 21%; silica sand, by 19%; aluminum (unwrought), by 17%; sand and gravel, by 15%; zinc (ores and concentrate), by 13%; bauxite and gypsum and anhydrite, by 8% each; cement, by 5%; and alumina, by 3%. Output for iron ore and coal remained about the same in 2014 as in 2013. The production of ferrosilicon and graphite were estimated to be zero (table 1).

Structure of the Mineral Industry

The leading production companies in the mineral industry were privately owned, with the exception of the two coal-producing power-generation companies, Elektroprivreda BiH, in which the government of the Federation of Bosnia and Herzegovina held a 90.4% ownership stake, and Elektroprivreda Republike Srpske, which was wholly owned by the government of the Republic of Srpska (100%). The Government of Bosnia and Herzegovina continued to hold a 44% ownership stake in the aluminum producer Aluminij d.d. Mostar (Aluminij Mostar), which was not fully privatized as of yearend 2014 as previously planned (European Bank for Reconstruction and Development, 2014b; Elektroprivreda BiH, 2015b; U.S. Department of State, 2015, p. 5).

The majority (80%) of companies in the metal processing sector were small-sized companies in terms of employment and revenue; medium-sized companies made up 15% of the total number of metallurgical companies, while large companies accounted for 5% of the total. The two leading large-scale mineral commodity producers, Aluminij Mostar, and the steel producer ArcelorMittal Zenica, accounted for most of the metal sector's output and employment. Table 2 is a list of major mineral industry facilities operating in Bosnia and Herzegovina in 2014 (table 2; Foreign Investment Promotion Agency of Bosnia and Herzegovina, 2014b; U.S. Department of Commerce, 2014, p. 16).

Mineral Trade

The value of Bosnia and Herzegovina's total exports in 2014 increased by 3.6% to $5.9 billion[1] and the value of the country's total imports increased by 6.8% to about $11 billion. As a result, the ratio of exports to imports by value decreased to 53.6%. Bosnia and Herzegovina's exports, in particular exports of the metal processing sector, were purchased primarily by member states of the European Union (EU) and the Central European Free Trade Agreement (CEFTA). The decrease in the global prices of base metals and electrical energy, which were two key export categories for Bosnia and Herzegovina, as well as low demand from its primary trading partners in the EU, limited the growth of the country's exports. Its imports increased significantly owing to an increase in the demand for imported goods in the aftermath of the floods, in particular for goods to rebuild public infrastructure. A significant decrease in the country's mineral commodity imports was largely owing to the decrease in the global price of petroleum (U.S. Department of Commerce, 2014, p. 16; Agency for Statistics of Bosnia and Herzegovina, 2015a, p. 1, 22–23; Central Bank of Bosnia and Herzegovina, 2015, p. 26).

In 2014, mining and quarrying exports decreased by 2.7% compared with those in 2013 and made up 1.3% of total exports. The exports of coal and lignite increased by 18.2% to $29.3 million and accounted for 38% of the total value of mining and quarrying exports. The exports of metal ores decreased by 12.2% to $33.9 million and accounted for about 43.8% of total exports. Mining and quarrying imports decreased by 9.8% and made up 9.5% of total imports in 2014. The imports of crude petroleum and natural gas decreased by 12.4% to $719 million and accounted for about 76.1% of the total value of mining and quarrying imports. The imports of coal and lignite increased by 3% to $218.5 million and accounted for about 21% of total imports (Agency for Statistics of Bosnia and Herzegovina, 2015a, p. 1, 22–23).

Among manufactured mineral products, base metals continued to be the most significant export category of Bosnia and Herzegovina. Exports of base metals decreased by 2.6% to $749.5 million in 2014 and made up 12.7% of the country's total exports. Among these, aluminum exports decreased (by value) by 3.4%; an increase in the global price of aluminum in the second half of 2014 reduced the size of the total decrease for the year. Iron and steel exports increased by 3.8% to $362 million despite a substantial decline in the global price of iron ore. Exports of coke and refined petroleum products increased by 3.3% to $328 million and accounted for about 5.6% of total exports, and exports of nonmetallic mineral products increased by 23.3% to $61.5 million or 1% of total exports. Coke and refined petroleum products were the second leading import category of the country. Imports of coke and refined petroleum products were valued at $756 million and made up about 6.9% of the country's total imports (by value). Imports of base metals decreased by 0.1% to $641 million and accounted for about 5.8% of total imports. Imports of iron and steel increased by 2% to $341.6 million and accounted for 3.1% of total imports, and imports of nonmetallic mineral products increased by 10.1% to $266.4 million or 2.4% of the total (Agency for Statistics of Bosnia and Herzegovina, 2015a, p. 14–15; 22–23; Central Bank of Bosnia and Herzegovina, 2015, p. 26).

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[1] Where necessary, values have been converted from Bosnia and Herzegovina convertible marks (BAM) to U.S. dollars (US$) at an average rate of BAM1.474= US$1.00 and from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014.

Bosnia and Herzegovina's exports to the United States were valued at $83.3 million in 2014 compared with $57.7 million in 2013. Mineral exports to the United States included, in descending order of value, $3.4 million in petroleum products, $2.5 million in finished metal shapes, $877,000 in tin, $98,000 in iron and steel, and $35,000 in bauxite and aluminum. Bosnia and Herzegovina's imports from the United States were valued at $46.1 million in 2014 compared with $38.5 million in 2013. Mineral imports from the United States included $19.1 million in coal and $42,000 in petroleum products, except fuel oil (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—"Alumina" d.o.o. Zvornik (Alumina Zvornik) remained the only producer of alumina in Bosnia and Herzegovina. The company's alumina plant in the industrial zone of Zvornik produced 170,646 t of alumina in 2014 compared with 175,961 t in 2013 and operated at less than 30% of its capacity owing to ongoing bankruptcy. Alumina Zvornik had entered bankruptcy in April 2013 citing financial losses owing to the high cost of natural gas and decreases in the prices of alumina and aluminum on world markets. It had outstanding liabilities to regional power utilities, suppliers, railway companies, and its own employees. The Government appointed a new management team to determine the status of the plant and to maintain production during bankruptcy. UAB Ukio Banko Investicine Grupe of Lithuania, which was Alumina Zvornik's majority owner, disputed the Government's transfer of its ownership to a local entity in July 2013 and asked the commercial court of Banja Luka to annul it in May 2014. No further updates were available as of yearend 2014 ("Alumina" d.o.o. Zvornik, 2013a, b; Dimitrievska, 2013; Zuvela, 2013; bne IntelliNews, 2014).

Bauxite for alumina production at Alumina Zvornik was supplied from mines in the vicinity that were operated by "Boksit" AD Milici, whose core business was bauxite ore mining. Boksit Milici was engaged in developing new bauxite ore deposits in order to ensure long-term production and delivery. In July 2014, Alumina Zvornik and Boksit signed a $138 million contract for bauxite deliveries between 2015 and 2020. In November 2014, the two companies signed a $19 million contract; Boksit would provide a substantial portion of the bauxite ore Alumina Zvornik needed in 2015, which would also fully utilize Boksit's mining capacity (Dimitrievska, 2014b, c).

Aluminij d.d. Mostar (Aluminij Mostar), which was Bosnia and Herzegovina's only aluminum producer as well as the country's leading exporter, produced 125,531 t of aluminum in 2014. The company once again faced possible closure in 2014 after shutting down production at its smelter in Mostar twice in 2013 owing to outstanding debts for electricity owed to the local power company Elektroprivreda Hrvatske Zajednice Herceg Bosne (EPHZHB) d.d. Mostar. Aluminum production had resumed in 2013 after the Government agreed to take a 44% stake in Aluminij Mostar and promised further subsidies in June 2013. Aluminij Mostar subsequently signed a Government-mediated debt-settlement agreement with EPHZHB in October 2013 that required it to start repayment in February 2014. In April 2014, EPHZHB announced that it would halt the delivery of electricity to Aluminij Mostar, which accounted for 50% of its total sales, owing to the nonpayment of debt in accordance with the October 2013 agreement. In June 2014, the Government made its further support to Aluminij Mostar's operations conditional on a new debt repayment agreement with EPHZHB. In September 2014, the two companies reached an agreement to settle about $80 million in unpaid electricity bills in 48 monthly installments. Aluminij Mostar narrowed its loss to $33 million in 2014 from $50 million in 2013. The company reportedly required an investment of about $4 to $5 million in order to maintain its current production capacity and an additional $10 million to return to its peak production capacity of 2011 (Dimitrievska, 2014a, d; Sito-Sucic, 2014; Daskalovic, 2015a).

Ferrosilicon.—Steelmin Ltd. resumed operations at the Steelmin BH smelter company in 2013 after the company completed refurbishment of the plant at Jajce, which had begun in the second quarter of 2012. Steelmin had acquired an 80% stake in late 2011 and in May 2012, the company obtained environmental approval for the refurbishment project. The largest furnace at the smelter had a production capacity of 25,000 metric tons per year (t/yr). Steelmin BH exported its ferrosilicon output to major steel producers in Europe (Steelmin Ltd., 2014).

B.S.I. d.o.o., which was owned by Metalleghe S.p.a. since 2004, was the other ferrosilicon producer in Bosnia and Herzegovina. The company's plant at Jajce had three electric furnaces that produced silicon metal. BSI exported its total production of about 18,000 t/yr to 20,000 t/yr to aluminum and silicon alloy producers in Germany, Hungary, Italy, Poland, and Slovakia (B.S.I. d.o.o., 2014).

Lead and Zinc.—Gross d.o.o. Gradiska, which was a subsidiary of Mineco Ltd. of the United Kingdom and Metexcel Trading Ltd. of Cyprus, owned the Sase lead and zinc mine in the municipality of Srebrenica. The company extracted and processed lead and zinc ore in the Kazan, Srebrenica, Srebrenica II, and Vitlovac deposits, which are located near the city of Srebrenica. In 2014, Gross d.o.o Gradiska produced about 30,000 t of lead-zinc concentrate (gross weight) compared with about 28,000 t in 2013; it employed 524 workers in 2014. The increase in production allowed the company to invest in the reconstruction of mining facilities and the purchase of new equipment in 2014. Improvements were part of the long-term mine rehabilitation and modernization program that Gross d.o.o. Gradiska had implemented since it acquired the mining concession from the Government of the Republic of Srpska in November 2007 (Gross d.o.o. Gradiska, 2015a–d).

Iron and Steel.—ArcelorMittal Prijedor, which was jointly owned by ArcelorMittal S.A. (51%) of Luxembourg and Rudnici Zeljezne Rude "Ljubija" a.d. Prijedor (49%), produced 2.1 Mt of aggregated lumps and fines (salable production) in 2014. The run-of-mine production was 3.0 Mt. The company extracted iron ore from the Buvac pit, which was opened in 2008 and was the only pit in operation since 2011, and supplied iron ore concentrates to ArcelorMittal subsidiaries in Europe, in particular to steel-producer ArcelorMittal Zenica, which was located about 243 kilometers (km) south of Prijedor at Zenica. ArcelorMittal Prijedor held mineral rights to 2,000 hectares. As of December 31, 2014, the proven reserves were estimated to be 10 Mt grading 46.4% iron and the probable ore reserves were estimated to be 14 Mt grading 45.8% iron (ArcelorMittal S.A., 2015a, p. 213, 215, 216, 220, 221; 2015b).

ArcelorMittal Zenica, which was the largest foreign investor in Bosnia and Herzegovina, operated an integrated plant with a coke oven, sintering plants, a blast furnace, a steel plant, two rolling lines for rebar and wire rod, and a mesh plant at Zenica. The company's output of such hot-rolled products as rebar, wire rod, and wire products (such as mesh and lattice girders) were exported mainly to markets in the Balkans, the EU, and North Africa. The blast furnace had a full capacity of 1.1 million metric tons per year (Mt/yr) and produced about 337,000 metric tons (t) of wire rod and 268,000 t of bars in 2014. In December 2014, ArcelorMittal Zenica launched a project to install advanced dust filters in its basic oxygen furnace. The new project followed the company's $8 million investment in filters at the blast furnace in November 2013; both projects were part of the environmental upgrades program that the company has implemented since 2005 (ArcelorMittal S.A., 2015c–e, p. 42; 2015f).

Industrial Minerals

Cement.—Fabrika Cementa Lukavac d.d., which was a wholly owned subsidiary of Asamer Baustoffe AG of Austria, continued to be the leading manufacturer of portland and masonry cement in Bosnia and Herzegovina. Tvornica Cementa Kakanj d.d. (TCK), which was a wholly owned subsidiary of HeidelbergCement AG of Germany, operated one cement plant and four ready-mixed concrete plants in the country. TCK's cement production decreased by about 10% to 420,000 t in 2014 owing in part to political instability in February and floods in May, which reduced domestic construction activity. Bosnia and Herzegovina's cement consumption was estimated to be about 1.2 million metric tons (Mt) in 2014. TCK used alternative fuels for the first time in its plants in 2014. The company planned to invest about $13 million through 2018 on environmental upgrades to modernize its cement mills and dust collection systems (Fabrika Cementa Lukavac d.d., 2014; Global Cement, 2014c; Daskalovic, 2015b; HeidelbergCement AG, 2015, p. 64, 105).

In June 2014, Schaefer Kalk Gmbh & Co. of Germany began preparations for the construction of a new lime plant in the city of Mostar that was expected to require an investment of $38 million; it would be jointly owned with BFS, which was a subsidiary of the Stanic Group. All lime output would be exported to markets in Africa, Asia, and Europe; Mostar was chosen as the site of the plant owing to its proximity to Ploce, the leading export port in Croatia. In September 2014, Oetelshofen Kalk of Germany announced plans to become a partner with Geoinzenjering in the construction of a new lime plant at Tuzla. During the first stage of the project, the two companies planned to produce construction aggregates. Also in September 2014, CEMEX S.A.B. de C.V. of Mexico, which operated six terminals in Bosnia and Herzegovina for bulk and bagged cement through its subsidiary Cemex Croatia of Croatia, acquired the concrete plant at Kiseljak from BINIS Beton d.o.o (Aggregates Business Europe, 2014; eKapija.BA, 2014; Global Cement News, 2014a, b; Saunders, 2015).

Mineral Fuels and Related Materials

Bosnia and Herzegovina's primary energy supply sources were coal, petroleum, and petroleum products. The country's energy import dependency was relatively low owing to domestic production of subbituminous coal and lignite and renewable energy sources such as hydropower and biofuel; however, it imported 100% of its petroleum and natural gas supply (European Association for Coal and Lignite, 2013, p. 70; European Bank for Reconstruction and Development, 2014a, p. 9; Energy Community, 2014, p. 48).

Coal.—In 2014, Bosnia and Herzegovina produced about 6.0 Mt of subbituminous coal and 5.7 Mt of lignite coal; production was slightly lower for both in 2014 than in 2013. Coal accounted for most of the country's primary energy production. About two-thirds of coal output was from underground mines and one-third from opencast mines. As of 2013 (the latest year for which data were available), Bosnia and Herzegovina were estimated to have reserves of 1.3 billion metric tons (Gt) of lignite and 827 Mt of subbituminous coal. The largest deposits were located in the Kreka-Banovici coal basin near Tuzla in northeastern Bosnia. Most coal mines belonged to the utility companies Elektroprivreda BiH and Elektroprivreda Republike Srpske, each of which operated hydropower and coal-fired powerplants. In 2014, coal consumption by thermal powerplants owned by Elektroprivreda BiH increased by 4.9% to reach 5.8 Mt (World Bank, The, 2012, p. 129; European Association for Coal and Lignite, 2013, p. 70; Energy Community, 2014, p. 48; Agency for Statistics of Bosnia and Herzegovina, 2015c, p. 3; Elektroprivreda BiH, 2015a, p. 15, 25).

In 2014, Elektroprivreda BiH invested about $32 million in equipment and $1.4 million in cash in the seven coal mines it has operated since 2009. These investments represented the largest the company had made as part of its recapitalization program of 2010. The purpose of the investments was to reconstruct coal mining capacity, increase productivity, and enhance mine safety. The increase in coal production was needed to meet the demand from proposed new thermal coal-fired powerplants such as Ugljevik III, which would use subbituminous coal from the surface mines at Delivi, Pelijave-Tobut, and Baljak in the municipality of Ugljevik and from new units at the Tuzla and Kakanj thermal powerplants. The construction of Unit 7 at the Tuzla powerplant in northern Bosnia was one of the largest investments in energy infrastructure undertaken among Balkan countries. Once completed, the Tuzla plant would have electricity generation capacity of 2,756 gigawatt hours (GWh) (Energy Community, 2013, p. 25, 26; Elektroprivreda BiH, 2015b, p. 37; Marinkovic and Dzaferovic, 2015, p. 49).

Natural Gas and Petroleum.—Bosnia and Herzegovina did not produce natural gas or crude petroleum onshore or offshore in 2014. The country's natural gas and crude petroleum supplies were mainly imported from Russia. Bosnia and Herzegovina had about 800,000 cubic meters of petroleum storage capacity, of which 532,707 cubic meters were provided by the Bosanski Brod refinery. The Government also owned a terminal at the Port of Ploce, Croatia, with a storage capacity of 84,000 cubic meters (table 1; Energy Community, 2014, p. 54, 59).

Initial steps were taken in 2014 to begin hydrocarbon exploration in Bosnia and Herzegovina. The Government signed a memorandum of understanding with the Shell Exploitation Company B.V. (Shell) of the United Kingdom to conduct a detailed assessment of the prospects for gas and petroleum extraction in the country. Shell subsequently expressed interest in beginning negotiations for concessions for petroleum extraction in Bosnia and Herzegovina. The Government also announced a tender for the selection of professional consultants for the purpose of concluding agreements for a 25-year period with prospective parties on the exploration and extraction of petroleum on the country's territory (Marinkovic and Dzaferovic, 2015, p. 49).

Outlook

In the near term, Bosnia and Herzegovina will remain a relatively minor producer of mineral commodities globally, but the country's mineral industry will continue to contribute substantially to its national output and employment. Metals are expected to remain valuable export commodities. Alumina and aluminum production may recover if Alumina Zvornik is successfully restructured during bankruptcy and if Aluminij Mostar resolves its outstanding debts, but output may continue to decline in the short term until their problems are resolved; Government subsidies may be necessary for the sustained operation of both companies. Cement production is expected to increase owing to the construction of new plants and to the need to rebuild infrastructure in the aftermath of damage caused by floods in 2014. Lead-zinc ore production is likely to increase under Gross Gradiska's mine modernization program. Coal production is expected to increase in the coming years owing to ongoing modernization efforts by Elektroprivreda BiH and the increased demand for coal from new thermal coal-fired powerplants that are under construction. The country is likely to remain dependent on imports of crude petroleum and natural gas as exploration activity is just about to begin and no domestic hydrocarbon production is expected in the short term.

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TABLE 1
BOSNIA AND HERZEGOVINA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]	2010	2011	2012	2013	2014
METALS					
Alumina	269,414	261,874	202,416	175,961	170,646
Aluminum:					
Primary	118,000	130,875	101,000 [e, r]	129,000 [e, r]	125,531
Unwrought aluminum, including alloys	150,488	163,954	159,660	157,191	131,238
Bauxite	844,027	707,712	800,316	657,115	605,215
Iron and steel:					
Ore and concentrate:					
Gross weight	1,401,000	1,891,000	2,075,732	2,121,907 [r]	2,127,564
Fe content[e]	588,000	794,000	872,000	899,000	901,000
Metal:					
Crude steel	590,757	648,560	700,341	722,155	792,019
Ferroalloys, ferrosilicon[e]	870	1,800	--	--	--
Pig iron	620,935	684,734	749,539	759,100	860,430
Lead:					
Ores and concentrate, gross weight	5,811	6,648	7,210	8,105	7,533
Pb content[e]	3,200 [r]	3,700 [r]	4,000 [r]	4,500 [r]	4,200
Metal, smelter, secondary[e]	4,500	3,400	3,300	2,400	1,200
Silicon, metal	17,972 [r]	17,527 [r]	15,874 [r]	16,707 [r]	18,383
Zinc:					
Ores and concentrate, gross weight	10,025	12,477	13,331	16,631	14,422
Zn content[e]	5,500 [r]	6,900 [r]	7,400 [r]	9,200 [r]	8,000
INDUSTRIAL MINERALS					
Barite	57	13	28	30 [e]	30 [e]
Cement	948,513	893,017	845,657	881,580	840,211
Clays:					
Bentonite	314	--	--	18,808	80,952
Kaolin, crude	41,808	232,147	149,495	44,940	21,610
Dolomite, crude	199,757	87,635	127,774	59,851	58,241
Graphite	45,079	-- [e]	-- [e]	-- [e]	-- [e]
Gypsum and anhydrite	64,570	71,870	73,665	73,300	67,700
Lime	339,429	488,577	397,802	386,908 [r]	427,914
Salt, all sources	662,631	833,734	862,017	856,713 [r]	921,239
Sand and gravel:					
Gravel	979,472	913,129	1,126,176	1,089,402	921,808
Sand, construction	572,452	1,095,486	499,916	625,509	347,747
Silica sand	227,721	118,978	121,491	113,576	92,427
Sodium compounds, sodium bicarbonate	35,986	47,847	58,620	66,340	73,460
Stone:					
Dimension:					
Marble and travertine	2,674	1,836	692	411	225
Ecaussine and other calcareous stone	66,133	141,245	234,120	48,827	88,500
Granite	4,920 [r]	29,441 [r]	2,944 [r]	8,413	13,467
Porphyry, basalt and other building stone	1,000,000 [e, r]	1,095,486 [r]	1,728,593 [r]	2,156,256	2,053,809
Slate	525 [r]	252 [r]	30 [r]	87,202 [r]	11,684
Crushed	3,776,726	4,369,575	3,711,065	4,216,610	4,485,649
Limestone, crushed and powdered	1,916,642	1,850,140	1,834,677	2,399,580	1,897,225
MINERAL FUELS AND RELATED MATERIALS					
Coal, subbituminous and lignite — thousand metric tons	10,976	12,738	12,312	11,765	11,673
Coke	919,962	886,911	696,231	748,834	908,662
Petroleum refinery products[3] — 42-gallon barrels	8,920,000	9,880,000	8,590,000	8,950,000	8,360,000

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. -- Zero.

[1] Table includes data available through November 5, 2015.

[2] In addition to commodities listed, calcined gypsum, common clay, crude ceramic clay, magnesite, manganese ore, soda ash, and steel semimanufactures may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Data were converted to barrels from metric tons and were reported as follows: 2010—1,114,669; 2011—1,235,519; 2012—1,073,292; 2013—1,118,758; and 2014—1,044,768.

TABLE 2
BOSNIA AND HERZEGOVINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	"Alumina" d.o.o. Zvornik (UAB Ukio Banko Investicine Grupe, 56.8%; Government of Republika Srprska, 9.1%; Balkanika, 7.1%; Restitution Fund, 4.6%)	Plant at Zvornik	600.[1]
Aluminum	Aluminij d.d. Mostar (Government of Federation of Bosnia and Herzegovina, 44%; Employees, 44%; Government of Croatia, 12%)	Smelter at Mostar	160.
Bauxite	"Boksit" AD Milici	Mine at Milici, west of Srebrenica	1,500.
Cement	Tvornica Cementa Kakanj d.d. (HeidelbergCement AG, 100%)	Plant at Kakanj	500.
Do.	Fabrika Cementa Lukavac d.d. (Asamer Baustoffe AG, 100%)	Plant in Lukavac	800 cement, 600 clinker.
Coal:			
Brown	RMU Banovici (Government, 69.3%, and employees, 30.7%)	Opencast mines at Cubric, Grivice, and Turija, and underground mines Omazici and Separacija at Banovici	1,500.
Do.	Zenica Group (Elektroprivreda BiH, 100%)	Stara Jama, Raspotocje, and Stranjani Mines at Zenica	NA.
Do.	Durdevik Group (Elektroprivreda BiH, 100%)	Potocari and Visca II opencast mines and Durdevik underground mine south of Zivinice	NA.
Do.	Kakanj Group (Elektroprivreda BiH, 100%)	Vrtliste opencast mine at Kakanj	NA.
Do.	do.	Haljinici underground mine about 5 kilometers southeast of Kakanj	NA.
Do.	Breza Group (Elektroprivreda BiH, 100%)	Sretno and Kamenice underground mines 20 kilometers northwest of Sarajevo	NA.
Do.	Abid Lolic Group (Elektroprivreda BiH, 100%)	Grahovcici underground mine 10 kilometers west of Zenica	NA.
Do.	Tusnica Mine	Drage opencast mine at Livno	NA.
Do.	Rudnik i Termoelektrana Ugljevik (Elektroprivreda Republike Srpske, 100%)	Opencast mine at Ugljevik	NA.
Lignite	Kreka Group (Elektroprivreda BiH, 100%)	Opencast mine at Dubrave	NA.
Do.	do.	Opencast mine at Sikulje	NA.
Do.	do.	Underground mines at Mramor, about 5 kilometers northeast of Lukavac and Bukinje, located between Tuzla and Lukavac	NA.
Do.	EFT Rudnik i Termoelektrana Stanari d.o.o. (EFT Group)	Stanari opencast mine 20 kilometers west of Doboj	1,100.[e]
Do.	Rudnik I Termoelektrana Gacko (Elektroprivreda Republike Srpske, 100%)	Opencast mine at Gacko	NA.
Do.	Gracanica Group (Elektroprivreda BiH, 100%)	Dimnjace opencast mine at Gornji Vakuf-Uskoplje	NA.
Do.	Tusnica Mine	Opencast mine at Livno	NA.
Coke	Global Ispat Koksa Industrija d.o.o. Lukavac (Global Steel Holdings and Coke and Chemical Conglomerate	Lukavac	700.
Do.	ArcelorMittal Zenica (ArcelorMittal S.A.)	Plant at Zenica	NA.
Iron and steel:			
Ferroalloys, ferrosilicon	Steelmin BH (Steelmin Ltd., 80%, and Kemokomplex Group, 20%)	Plant at Jajce	25.
Do.	B.S.I. d.o.o. (Metalleghe S.p.a., 100%)	do.	20.
Iron ore	ArcelorMittal Prijedor (ArcelorMittal S.A., 51%, and Rudnici Zeljezne Rude "Ljubija" a.d. Prijedor, 49%)	Buvac open pit mines at Ljubija	3,000.
Pig iron	ArcelorMittal Zenica (ArcelorMittal S.A.)	Blast furnace at Zenica	1,100.

See footnotes at end of table.

TABLE 2—Continued
BOSNIA AND HERZEGOVINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel—Continued:			
Steel:			
Crude	ArcelorMittal Zenica (ArcelorMittal S.A.)	Plant at Zenica	1,100.
Crude, secondary	Jelsingrad Livar Steel Foundry a.d.	Banja Luka	NA.
Semimanufactured products	ArcelorMittal Zenica (ArcelorMittal S.A.)	Plant at Zenica	NA.
Lead-zinc ore	Gross d.o.o. Gradiska (Mineco Ltd., 66.67%, and Metexcel Trading Ltd., 33.33%)	Sase Mine and mill at Srebrenica	35.[2]
Petroleum, refined thousand 42-gallon barrels	Rafinerija nafte Brod a.d. (OAO "NefteGazInkor," 80%)	Oil refinery at Bosanski Brod	30,000.
Do.	Rafineriji ulja Modriča a.d. Modriča (OAO "NefteGazInkor," 77%)	Oil refinery at Modrica	NA.
Salt	Rudnik Soli Tuzla d.d.	Tuzla	NA.

[e] Estimated. Do., do. Ditto. NA Not available.

[1] The company entered bankruptcy in 2013.

[2] Gross weight of ore.

THE MINERAL INDUSTRY OF BULGARIA

By Elena Safirova

The major raw materials extracted in Bulgaria in 2014 included clays, copper, gypsum, lead, lignite, limestone, salt, sand and gravel, and zinc. The metallurgical sector smelted and refined copper, lead, silver, and zinc; produced crude steel; and processed products. Production quantities of crude oil and natural gas were insignificant (table 1).

As of 2014, Bulgaria had been a member of the European Union (EU) for 8 years. The country signed an EU accession treaty in April 2005 and joined in January 2007. Bulgaria's integration into the EU was not smooth. Initially, the country faced tough entry requirements that reflected concerns about transparency in the country's Government and law enforcement. Nevertheless, in 2014 the Finance Minister announced that Bulgaria's net financial gain from 8 years of EU membership amounted to 14.7 billion leva[1] (about $1 billion), which reflected both Bulgaria's contributions to the EU budget and the EU funding provided to the country. It was not clear, however, if the calculations had taken into account either the financial corrections imposed on the country or the economic benefits of being an EU member (British Broadcasting Corp., 2012; Tishkina, 2014; Novinite.com, 2015).

At the beginning of 2013, Bulgaria was involved in two competing gas pipeline projects—the Nabucco and the South Stream. The Nabucco project was canceled in June 2013. The construction of the South Stream pipeline, which was led by Gazprom of Russia, was expected to begin in the summer of 2014, and Bulgaria was supposed to be the first country to begin construction. During 2014, the approval process related to the construction of the South Stream pipeline was delayed several times and was not completed by the EU and the Government of Bulgaria. In December, the President of Russia announced his decision to cancel the South Stream project and to work on a new Turkey Stream project instead. After cancellation of the South Stream pipeline, Bulgaria asked the European Commission (EC) for compensation expenses related to the construction of the pipeline, but the EC did not find sufficient reasons for the compensation (RIA.ru, 2014; British Broadcasting Corp., 2015).

Minerals in the National Economy

In 2014, Bulgaria's real gross domestic product (GDP) increased by 1.6% compared with that of 2013; the nominal GDP was $55.7 billion. The production value of the mining and quarrying industry was about $1.64 billion, which accounted for about 3.9% of the total production value of industrial enterprises compared with 4.1% (revised) in 2013. The production value of basic metal and fabricated metal products (except machinery and equipment) in 2014 was $6.79 billion, which accounted for about 16.2% of the total production value of industrial enterprises compared with 16.0% in 2013. In 2014, the production value of the mining and quarrying sector (in constant 2010 prices) increased by 3.0%, whereas in 2013 the production value of the mining and quarrying sector decreased by 6.3% (National Statistical Institute, 2015a, c).

Production

In 2014, estimated fluorspar production increased by 67%; zinc mine production, by 33%; and crude steel production, by 17%. Primary and secondary copper smelter output increased by 7.5%; output of rolled steel products and estimated production of industrial lime increased by 7.2% and 7.1%, respectively. Silver metal production decreased by 9.8%, cadmium metal production decreased by 7.1%, and petroleum refining decreased by 6.2%. These and other data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2014, the total value of Bulgaria's exports was about $29.3 billion compared with about $29.6 billion in 2013. The total value of Bulgaria's imports was about $34.8 billion compared with $34.3 billion in 2013. Among exported goods, inedible crude materials (excluding fuel) accounted for 7.2% of all exports, and mineral fuels, lubricants, and related materials contributed 13.0% to the value of exports. The country's major export trade partners were, in descending order of value, Germany (which received 12.0% of Bulgaria's exports), Turkey (9.4%), Italy (9.0%), Romania (7.9%), Greece (6.7%), France (4.3%), Belgium (4.2%), Singapore (2.6%), and China and Russia (2.4% each) (National Statistical Institute, 2015b).

Nonfood crude materials (excluding fuel) accounted for 8.4% of Bulgaria's imports, and mineral fuel, lubricants, and related materials accounted for another 20%. Bulgaria's major import trade partners were, in descending order of value, Russia (which supplied 15.2% of Bulgaria's imports), Germany (12.2%), Italy (7.0%), Romania (6.8%), Turkey (5.7%), Greece (5.1%), and Spain (4.9%) (National Statistical Institute, 2015b).

In 2014, Bulgaria exported 858,300 metric tons (t) of rolled ferrous metals and imported 1,161,300 t of rolled ferrous metals. Bulgaria was a net exporter of scrap ferrous metals, having exported 399,000 t of scrap; its imports of scrap metal totaled 115,500 t. In 2014, Bulgaria was importing finished ferrous metal products, in particular seamless pipes, in preparation for the construction of the South Stream pipeline. Imports of finished metal articles increased by 130% to 664,200 t in 2014 from 288,500 t in 2013; exports of finished metal articles were lower, yet continued to increase as they had during the past 5 years. In 2014, Bulgaria exports of finished ferrous products totaled 132,900 t, which was an 11.9% increase from the total in 2013 (Bulgarian Association of the Metallurgical Industry, 2015).

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[1] Where necessary, values have been converted from Bulgarian leva (BGN) to U.S. dollars (US$) at an average annual exchange rate of BGN1.474=US$1.00 for 2014 and BGN1.474=US$1.00 for 2013 and from euro area euros (EUR) to U.S. dollars at an average annual exchange rate of EUR0.732=U.S$1.00 for 2013.

In 2014, Bulgaria exported a total of 643,846 t of nonferrous metals, finished products, and scrap, which was valued at 5,012 million leva (about $3,400 million). Compared with exports in 2013, the physical amount of exports increased by 1.8% in 2014, but the total value of exported products decreased by 5.7% owing to lower commodity prices for nonferrous metals. The nonferrous metals sector retained its strong export orientation—about 87.5% of the output was exported. In 2014, Bulgaria imported 260,231 t of nonferrous metals that was valued at 1,451.3 million leva (about $984 million) (Bulgarian Association of the Metallurgical Industry, 2015).

Commodity Review

Metals

Copper.—Aurubis AG of Germany, through its subsidiary Aurubis Bulgaria AD, owned the country's only copper smelting and refining facility, which is located in the town of Pirdop. The company produced 381,024 t of anodic copper and 233,274 t of electrolytic copper in 2014 compared with 354,294 t and 229,604 t, respectively, in 2013. The company processed 1,165,484 t of copper concentrates containing 293,718 t of copper at an average copper content of 25.2%. The amount of concentrates processed in 2013 was 976,718 t. The raw materials for copper production also included 62,280 t of scrap metal. In September 2014, Aurubis announced that it was planning to invest 75 million euros (about $95.7 million) in its Pirdop plant. Of that amount, $25 million euros was earmarked for renovation projects in 2015, and the remainder of the money would be spent in 2016. In November, a new environmentally friendly rainwater treatment plant developed by Aurubis Bulgaria was unveiled. The development of the plant cost 6.3 million euros (about $8 million), and it was the third water treatment plant at the Pirdop facility, in addition to facilities designed to treat industrial and residential water. During its years in Bulgaria, Aurubis reportedly invested more than 1 billion leva ($680 million) and created more than 800 jobs (BTA.bg, 2014; Novinite.com, 2014; Aurubis AG, 2016).

Dundee Precious Metals Inc. of Canada (Dundee) owned and operated the Chelopech underground copper mine, which is located about 70 kilometers (km) east of the capital city of Sofia, through its 100%-owned subsidiary Chelopech Mining EAD. In 2014, the company extracted 20,100 t (44.3 million pounds) of copper in copper concentrate, which was a 3% decrease compared with production in 2013, because of lower recovery rates. In 2014, the copper head grade was 1.2%. Dundee acquired Chelopech in 2003, and since that time had quadrupled ore production to 2 million metric tons per year (Mt/yr), as well as improved technology and management practices at the mine. The copper concentrates produced at the Chelopech Mine were exported to be processed at Dundee's smelter in Tsumeb, Namibia (Dundee Precious Metals Inc., 2015).

Gold and Silver.—In 2014, gold production from the Chelopech Mine decreased by 6% to 3,870 kilograms (kg) (124,371 troy ounces). The production decrease was attributed to a lower gold recovery rate, which was partially offset by higher gold grades and higher volumes of ore processed. Recovery rates were lower in 2014 than in 2013 owing to the treatment of increased volumes of ore characterized by a higher sulfur-to-copper ratio than originally anticipated. Additionally, the introduction of pretreatment for the new pyrite flotation circuit had an unexpected negative effect on the recovery of copper and gold. Optimization work, which was completed in July, returned copper recovery rates to their original levels, but the gold recovery rates remained below their original rates. In 2014, the pyrite recovery project was the latest project to be completed at Chelopech; it was designed to capture a portion of the unrecovered gold contained in the pyrite minerals that previously were not processed. After the completion of the pyrite project (the pyrite recovery circuits were completed in the first quarter of 2014), Dundee was able to produce up to 260,000 metric tons per year (t/yr) of gold-bearing pyrite concentrate containing up to 1,560 kg, or 50,000 troy ounces, of gold. Following the commissioning of the pyrite recovery circuits, 1,130 kg (36,466 troy ounces) of gold contained in pyrite concentrate was produced. Dundee reported that, as a result of this project, the gold recovery rate at Chelopech increased to approximately 70%. In 2014, Dundee produced 7,340 kg (235,983 troy ounces) of silver, which was an 8% increase compared with the quantity produced in 2013. The increase in silver production was attributed to higher silver grades and the higher volume of ores processed but was partially offset by a lower silver recovery rate. Based on data available at yearend, Dundee planned to continue mining Chelopech through at least 2025, but expected to continue extending the life of the mine through in-mine exploration (Dundee Precious Metals Inc., 2015).

Dundee continued with its plan to develop the Krumovgrad open pit gold project, which it wholly owned. The project was located at Ada Tepa, which is about 3 km south of the town of Krumovgrad in southeastern Bulgaria. As of December 31, 2013, the proven and probable reserves of the two zones at the Krumovgrad deposit were estimated to be 25,100 kg (807,000 troy ounces) of gold and 13,800 kg (443,000 troy ounces) of silver; total resources of the deposit were 26,700 kg (859,000 troy ounces) of gold and 14,800 kg (477,000 troy ounces) of silver. Commissioning of the project was expected to take place in late 2016 or early 2017, and the total cost of mine construction was estimated to be $164 million. Dundee expected to produce about 2,640 kilograms per year (kg/yr) (85,000 troy ounces per year) of gold for at least 8 years. In 2009, Dundee received the Government certificate for the Krumovgrad discovery, and in 2011, it received approval of the environmental impact assessment for the project. As of 2014, Dundee was still awaiting the permits and the approvals from local authorities for mine construction (Mineral.ru, 2014; Dundee Precious Metals Inc., 2015).

Lead and Zinc.—In September 2012, Harmony 2012 Ltd., which was registered in the Virgin Islands, announced that it had purchased the heavily indebted lead and zinc plant

OTZK Kardzhali for 8.6 million leva (about $5.8 million). In December 2013, the company reported that construction work at the site of the bankrupt OTZK Kardzhali was expected to begin in June 2014. The company asked that the local authorities issue all required construction permits as soon as possible. The plan was to build a modern lead and zinc smelter by reconstructing the buildings and replacing all the equipment. Harmony 2012 provided assurances that the new plant would adhere to environmental standards and feature modern technology (Novinite.com, 2012, 2013).

Industrial Minerals

Cement.—In Bulgaria, cement was produced by four companies—Devnya Cement AD, Holcim (Bulgaria) AD, Vulkan Cement S.A., and Zlatna Panega Cement AD. These companies had a combined cement production capacity of 6.2 Mt/yr. Devnya Cement and Vulkan Cement, which had production capacities of 2.5 Mt/yr and 0.5 Mt/yr, respectively, were owned by Italcementi Group of Italy. Holcim Bulgaria AD, which was owned by Holcim Ltd. of Switzerland, had an capacity of 1.7 Mt/yr. Holcim operated the Beli Izvor cement plant, the Sofia and the Plovdiv Zlatna aggregate plants, and the Plovdiv and the Sofia ready-mix concrete plants. Zlatna Panega Cement AD, which was owned by the Greek company Titan Group, had an annual capacity of 1.5 Mt (Holcim Group Bulgaria, 2016; Italcementi Group, 2016; Titan Group, 2016).

In 2014, cement consumption in Bulgaria increased by 5% compared with a 1% decrease in 2013. The private construction sector started a revival in 2014 owing to lower interest rates for loans than in 2013, and the prices for residential housing increased by 3%. Also, there was a slight increase in infrastructure projects because of the end of the EU funding cycle. Although cement plants in Bulgaria operated much below their capacity, they continued to upgrade and to prepare for an increase in demand. In October, Devnya Cement launched a new $160 million euro ($219 million) production line with the capacity to produce 1.5 Mt/yr of cement. The revamp of the Devnya (Varna) plant began in 2012, and all elements of the new construction were planned to be fully operational in 2015. The new facility included a dry line, which had the capacity to produce 4,000 metric tons per day of clinker. The new line would have improved energy efficiency and would be able to use refuse-derived fuel and biomass. Devnya Cement, which was acquired by Italcementi in 1998, is located at the Black Sea port city of Varna. The proximity of the plant to the Port of Varna West provided access to countries located on the Black Sea and on the eastern part of the Mediterranean Sea (Andreevska, 2014; Italcementi Group, 2014; European Cement Association, The, 2015).

Mineral Fuels

Petroleum.—LUKOIL Oil Co. (LUKOIL) of Russia, through its subsidiary LUKOIL Neftochim Burgas AD, owned and operated the Burgas refinery, which is located on the Black Sea and is 15 km from the city of Burgas; it was the only oil refinery in Bulgaria. The refinery had a capacity of 9.8 Mt/yr (71.5 million barrels per year) and specialized in the production of fuel, petrochemicals, and polymers. About 60% of the refinery's output was exported to neighboring Balkan countries and Turkey. According to the news agency Novinite, LUKOIL Neftochim Burgas AD was the largest industrial enterprise in Bulgaria, and its revenue in 2014 exceeded 3.3 billion euros ($4.2 billion). Starting in 2009, all products produced at the Burgas refinery were compliant with the Euro 5 emission standards. In 2012, LUKOIL started the construction of a heavy residue hydrocracking complex at Burgas, which would be the 10th such unit in the world and the 1st in Eastern Europe. The project would allow LUKOIL to increase its production of Euro 5-compliant diesel by 1.2 Mt/yr and to halt production of high-sulfur fuel oil. The first stage of the project included the construction of a 2.5-Mt/yr vacuum-residue hydrocracker plant at a cost of about $1.5 billion. In 2014, LUKOIL completed an installation for processing sulfur and a natural gas pipeline for the project. In January, the company reported that it was able to secure a $570 million 10-year loan from a consortium of international banks to finance the completion of the modernization. The first stage of the project was expected to be completed by January 2015 (Kennedy, 2014; Oil&Gas Eurasia, 2015; Thomson Reuters, 2015; Lukoil.ru, 2016).

Outlook

Production of Bulgaria's mineral commodities depends mainly on the domestic and European economic outlook. Construction at the Burgas complex may increase the production of refined petroleum products significantly in the short run. Mining of copper, gold, and silver is likely to increase modestly. Nonferrous production is expected to remain at a modest rate of growth. Oil and gas production are expected to remain economically insignificant considering the current challenges at natural gas production fields and the lack of oil and shale gas exploration activities.

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TABLE 1
BULGARIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, metal, secondary		12,257 r	10,263 r	--	--	--
Bismuth, metal	kilograms	2,179	4,191	--	--	--
Cadmium, metal, smelter		457	428	360	411	382
Copper:						
Ore:						
Gross weight	thousand metric tons	27,581	28,214	26,700 r	25,600 r	24,600 e
Concentrate, Cu content		81,009	84,535	78,653	75,307	72,419
Metal, primary and secondary:						
Smelter		286,668	338,300	325,220	354,294	381,024
Refined, electrolytically		215,100	226,100	226,100	229,604	233,274
Gold, in concentrate	kilograms	4,489	5,302	7,058	7,385	7,000 e
Iron and steel:						
Metal:						
Steel, crude	thousand metric tons	737 r	835 r	641 r	523 r	612
Rolled products	do.	896	1,115	818	874	937
Lead:						
Mine output, Pb content		12,136	10,121	14,366	15,986	15,461
Metal, refined, primary and secondary		99,116	90,933	86,156	90,742	93,394
Manganese ore:[3]						
Gross weight		131,600	149,400	37,900	45,000	45,000 e
Mn content		36,900	41,800	10,600	12,600	12,600 e
Silver, metal	kilograms	27,538	32,144	46,523	55,637	50,200
Tellurium, metal	do.	2,468	4,872	2,472	5,014	4,932
Zinc:						
Mine output, Zn content		8,799 r	8,171 r	8,604 r	8,995 r	11,992
Metal, refined, primary and secondary		91,372	90,083	73,558	75,830	76,293
INDUSTRIAL MINERALS						
Barite ore, run-of-mine[e]		350	120	--	--	--
Cement, hydraulic	thousand metric tons	1,966	1,882	1,803	1,812 r	1,850 e
Clays:						
Bentonite	do.	100 e	54	78	80 e	80 e
Kaolin, raw		700,088	728,003 r	1,006,239 r	877,086 r	900,000 e
Fluorspar[e]		--	--	12,000 r	12,000 r	20,000 e
Gypsum and anhydrite, crude	thousand metric tons	110	115	114	110 e	115 e
Lime, industrial	do.	1,309	1,495	1,425	1,400 e	1,500
Limestone[e]	do.	5,000	5,000	5,800	5,200 r	5,200 e
Nitrogen, N content of ammonia[e]	do.	260	380	320	320	330 e
Perlite	do.	--	--	4	5 e	5 e
Salt, all types	do.	1,900	2,200	2,100	2,100 e	2,200 e
Sand and gravel	do.	7,653	6,776	6,213	6,530 r	6,600 e
Silica, quartz sand[e]	do.	660	660	660	660	680
Sulfuric acid		1,075,617	1,203,454	1,100,835	1,352,588	1,400,000 e
Vermiculite[e]		3,000	15,000	18,600	18,600	19,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Bituminous	thousand metric tons	3,000 r	2,400 r	2,300 r	2,100 r	2,000 e
Lignite	do.	27,200 r	34,500	31,000	26,400 r	26,000 e
Total	do.	30,200 r	36,900 r	33,300 r	28,500 r	28,000 e
Natural gas, marketed	million cubic meters	74	443	396	289	278
Petroleum:[4]						
Crude	thousand 42-gallon barrels	169	161	170	170 e	170 e
Refinery products	do.	43,400 r	42,400 r	46,400 r	46,600 r	43,700

See footnotes at end of table.

TABLE 1—Continued

BULGARIA: PRODUCTION OF MINERAL COMMODITIES[1]

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[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through January 6, 2016.

[2] In addition to the mineral commodities listed, a variety of metals and industrial minerals, including calcinate sodium carbonate, feldspar, refractory clays, sulfur, tin, and zeolites may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Reported by the International Manganese Institute.

[4] Figures were converted to barrels from thousand metric tons. Production of crude oil, by year, was reported as follows (in thousand metric tons): 2010—23; 2011—22; 2012—23; 2013—23; and 2014—23. Production of refined products, by year, was reported as follows (in thousand metric tons): 2010—5,950; 2011—5,810; 2012—6,350; 2013—6,380; and 2014—5,990.

TABLE 2
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bentonite, mine output		S&B Industrial Minerals AD	Kardjali	NA.
Cadmium		KCM A.D. (KCM 2000 Group)	Plovdiv	NA.
Do.		Lead and Zinc Complex Plc. (LZC) (Harmony 2012 Ltd., 50%)	Kardzhali	NA.[1]
Cement		Devnya Cement AD (Italcementi Group)	Devnya	2,500.
Do.		Vulkan Cement S.A. (Italcementi Group)	Dimitrovgrad	500.
Do.		Holcim (Bulgaria) AD (Holcim Ltd., 100%)	Beli Izvor	1,700.
Do.		Zlatna Panega Cement AD (Titan Group)	Zlatna Panega	1,500.
Coal:				
Bituminous		Balkan 2000 Mines EAD	Southeastern of Tvarditsa, Sliven District	NA.
Brown		Otkrit Vagledobiv Mines EAD	Pernik coal basin, southwest of Sofia	NA.
Do.		Vagledobiv Bobov Dol EOOD	Bobov Dol coalfield	NA.
Do.		Other small producers	Cherno More Mine in the Black Sea coalfield and Vitren Mine in Katrishte deposit	NA.
Lignite		Mini Maritsa Iztok EAD (state-owned Bulgarian Energy Holding EAD)	East Maritsa coal basin near Radnevo	3,500.
Do.		Other small producers	Beli Breg, Chukurovo, and Stanyantsi Mines	NA.
Copper:				
Concentrate, Cu content		Assarel-Medet JSC	Panagurishte, Pazardzhik District	50.
Do.		Ellatzite-Med AD (Geotechmin Co.)	Mine 8 kilometers south of Etropole, and concentrator near Mirkovo village	45.
Do.		Chelopech Mining EAD (Dundee Precious Metals Inc., 100%)	Chelopech	21.
Do.		Bradtze	Malko Turnovo	2.
Do.		Burgaskii Mines Ltd.	Zidorovo Mine at Burgas, near the Black Sea	1.
Metal:				
Smelter		Aurubis Bulgaria AD (Aurubis AG, 99.8%)	Pirdop	330.
Refinery		do.	do.	230.
Fluorspar	metric tons	Chiprovtzi Mine (Solvay S.A.)	Chiprovtzi, Montana Province	50,000.
Gold, in concentrate	kilograms	Chelopech Mining EAD (Dundee Precious Metals Inc., 100%)	Chelopech	4,000.
Do.	do.	Ellatzite-Med AD (Geotechmin Co.)	Mine 8 kilometers south of Etropole and concentrator near Mirkovo village	NA.
Do.	do.	KCM A.D. (KCM 2000 Group)	Plovdiv	NA.
Kaolin, mine output		Kaolin A.D.	Senovo, Rousse District	NA.
Lead-zinc:				
Concentrate, Pb-Zn content	metric tons	Gorubso AD (KCM 2000 Group and Minstroy Holding A.D.)	Kardjali	5,700 Pb, 5,500 Zn.
Do.	do.	Rudmetal JSC	Dimov Dol Mine, near Rudozem	2,900 Pb, 1,900 Zn.
Metal:				
Lead, refined		KCM A.D. (KCM 2000 Group)	Plovdiv	65.
Do.		Lead and Zinc Complex Plc. (LZC) (Harmony 2012 Ltd., 50%)	Kardzhali	33.[1]
Zinc, smelter		KCM A.D. (KCM 2000 Group)	Plovdiv	80.
Do.		Lead and Zinc Complex Plc. (LZC) (Harmony 2012 Ltd., 50%)	Kardzhali	28.[1]
Manganese ore		Obrochishte Mine (Euromangan AD)	Tsarkva village, 10 kilometers west of Balchik	NA.

See footnotes at end of table.

TABLE 2—Continued
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Natural gas	million cubic meters	Melrose Resources Bulgaria EOOD (Petroceltic International Plc)	Galata, Kaliakra, and Kavarna fields, in the Black Sea off the coast of Varna	400.
Do.	do.	Oil and Gas Exploration and Production Plc.	Bhutan, Bulgarevo, Dolni Dubnik, Durankulak, Marionov Geran, Selanovtzi, and Staroseltzi fields	NA.[2]
Perlite, mine output		S&B Industrial Minerals AD	Kardjali	NA.
Petroleum:				
Crude		Oil and Gas Exploration and Production Plc.	Bardarski Geran, Dolni Dubnik, Dolni Lukovit, Gorni Dubnik, Tjulenovo, Selanovtzi, Staroseltzi, and other oilfields	200.
Refined	thousand 42-gallon barrels	LUKOIL Neftochim Burgas AD (LUKOIL Oil Co.)	Refinery at Burgas	70,000.
Silver:				
In concentrate	kilograms	Chelopech Mining EAD (Dundee Precious Metals Inc., 100%)	Chelopech	18,000.
Metal	do.	KCM A.D. (KCM 2000 Group)	Plovdiv	55,000.
Steel, crude		Stomana Industry S.A. (Sidenor S.A., 100%)	Pernik	800.
Vermiculite, crude		Wolff and Muller Minerals Bulgaria OOD	Near Sofia	20.
Zeolites, mine output		S&B Industrial Minerals AD	Kardjali	NA.

Do., do. Ditto. NA Not available.

[1] Suspended.

[2] No gas production in 2013.

THE MINERAL INDUSTRY OF CROATIA

By Sinan Hastorun

Croatia is a moderately developed country located in the western part of the Balkan Peninsula. It has been a European Union (EU) member state since 2013, when it became only the second country from the former Republic of Yugoslavia after Slovenia to accede to the Union. Croatia has the longest coastline of the six countries bordering the Adriatic Sea and therefore among the Balkan countries, the largest offshore exclusive economic zone (EEZ) suitable for mineral fuel exploration.

The country produced a limited number of mineral commodities, none of which were produced in a quantity that was significant on a world or regional scale. Mineral resources included clays, dolomite, fertilizers, gypsum, limestone, natural gas, petroleum, and salt. Crude petroleum and natural gas extraction and refining remained the major economic activities of Croatia's mineral industry. The first international rounds of offshore and onshore hydrocarbon exploration licensing were launched in 2014. Crude steel output continued to increase after production restarted at ABS Sisak in 2013. Cement output remained flat owing to stagnation in domestic construction activity. The country remained reliant on mineral commodity imports for the bulk of its industrial and energy needs. Most industrial mineral output was consumed by the domestic market, particularly by the construction sector (European Commission, 2011, p. 3; Agency for Investments and Competitiveness, 2013; Maćešić and Manovelo, 2014b; European Commission, 2015c; Rajal and Santic, 2015, p. 59; U.S. Department of State, 2015, p. 6; World Steel Association, 2015, p. 2).

Minerals in the National Economy

In 2014, Croatia's economy continued to contract, albeit at a slower rate than in 2013. The country's gross domestic product (GDP) decreased by 0.4% in real terms in 2014 following a 0.9% decrease in the previous year. The nominal GDP in 2014 was $57.2 billion, a slight decrease from $57.9 billion (revised) in 2013. Croatia's economy experienced 6 consecutive years of recession since 2009, during which time the GDP decreased by 13% on a cumulative basis in the aftermath of the global economic downturn of 2008. The country's ongoing recession was primarily owing to lower domestic business investment and lower domestic demand for goods and services. The construction sector contributed negatively to economic growth, while industrial production made a positive contribution. Croatia's current account balance remained positive in 2014, albeit at 0.1% of the GDP, which was lower than in 2013. The trade deficit decreased to 15.4% of GDP as a result of higher exports of goods and services, particularly exports to other EU member states, and lower petroleum imports (by value) owing to the significant decrease in petroleum prices globally in the second half of 2014. Foreign direct investment (FDI) in 2014 increased threefold compared with 2013 (European Commission, 2015a, p. 86; International Monetary Fund, 2015, p. 4, 25; World Bank, The, 2015a; 2015b, p. 2).

The mineral industry was an important but contracting component of Croatia's national economy, generating about 5.6% of the gross value added in 2012 (the last year for which comprehensive data were available) compared with 5.3% in 2011. Among its components, the manufacture of coke and refined petroleum products accounted for 2.2%; the manufacture of fabricated metal products, except machinery and equipment, 1.4%; mining and quarrying, 0.7%; the manufacture of other nonmetallic mineral products, 0.7%; the manufacture of chemicals and chemical products, 0.4%; and the manufacture of base metals, 0.2%. The gross value added of the manufacture of coke and refined petroleum products increased by 12.2%; that of the manufacture of fabricated metal products, except machinery and equipment, by 2.6%; and that of mining and quarrying, by 2.4%, respectively, compared with that of 2011. On the other hand, the gross value added of the manufacture of base metals decreased by 9.8%; that of the manufacture of chemicals and chemical products, by 3.5%; and that of the manufacture of other nonmetallic mineral products, by 0.8%, respectively, compared with that of 2011. As of December 2013, the mining and quarrying sector comprised 386 registered and 291 active business enterprises and employed 5,262 people compared with 430 registered and 290 active enterprises and 5,593 employees in 2012 (Croatian Bureau of Statistics, 2013, p. 81, 141; 2014, p. 85, 147, 211–213).

Government Policies and Programs

The minerals industry in Croatia is regulated by the Mining Department of the Energy and Mining Directorate and the Croatian Hydrocarbon Agency. The Mining Department regulates and oversees all activities related to nonfuel minerals. It is responsible for issuing licenses for exploration and extraction of all minerals except for mineral fuels, for issuing building permits for mining facilities and plants, and for granting approvals for mining concessions. The Croatian Hydrocarbon Agency, which was established in February 2014 in accordance with the Act on the Establishment of the Hydrocarbon Agency, is authorized to issue tenders and permits for onshore and offshore exploration and exploitation of petroleum and natural gas resources. It also monitors the fulfillment of contractual obligations by permit holders and reports results to the European Commission. Finally, the Agency is responsible for documenting the hydrocarbon potential of Croatia (Croatian Hydrocarbon Agency, 2014; Directorate for Energy and Mining, 2014; Rajal and Santic, 2015, p. 58).

The Concession Act of 2012 (passed in November 2012), the Mining Act of 2013 (passed in April 2013), which replaced the Mining Act of 2009, and the Hydrocarbons Exploration and Exploitation Act (Hydrocarbons Act) of 2013 (passed in July 2013) are the principal laws governing all mineral extraction activities in Croatia in accordance with the Hydrocarbons Licensing Directive and the Carbon Capture and Geological Storage (CCS) Directive of the EU. The Mining Act of 2013 defines the criteria, conditions, and requirements for obtaining authorization to explore for and produce mineral commodities in Croatia. It establishes a public tendering procedure that is open to all interested entities, as required by the nondiscrimination clauses of the Hydrocarbons Licensing Directive. The Concession Act of 2012 defines the conditions of public-private partnership projects. It establishes a clear distinction between concession and public procurement contracts. The Hydrocarbon Act governs all onshore and offshore activities related to natural gas and petroleum in Croatia. Hydrocarbon exploration and extraction are regarded as two separate rights, as is the case with all other minerals; however, the tender procedure awards successful bidders an exploration license and an automatic right to a concession in the case of discovery (European Bank for Reconstruction and Development, 2013, p. 6; Maćešić and Manovelo, 2013; Rajal and Santic, 2015, p. 58).

The Act on Strategic Investment Projects of November 2013 sets up a one-stop shop to incentivize investment into sectors of national importance, including energy and utilities. The law specifies detailed investment, technology, and employment criteria for private, public, or public-private partnership projects to qualify as being of strategic importance and to receive financial support from the Government. It establishes a streamlined administrative process for expedited issuance of permits for such projects by excluding lower level administrative bodies from the approval process. The Act on Amendments to the Act on Strategic Investment Projects of December 2014 defines potential strategic projects as projects that could be implemented on state-owned properties. It establishes a procedure of public invitation to tender to select strategic investors. The new act also authorizes the Agency for Investments and Competitiveness to perform administrative oversight of projects (Maćešić and Manovelo, 2014c; Rajal and Santic, 2015, p. 59, 60; U.S. Department of State, 2015, p. 12).

The amended Gas Markets Act of February 2014 defines the new role of the wholesale supplier of natural gas in Croatia as the supplier of public suppliers at a regulated price. In April 2014, the state-owned electricity utility company HEP d.d. became the new wholesale natural gas supplier until 2017, replacing Prirodni plin d.o.o., which was the gas trading and import business arm of Croatia's primary mineral fuel producing company INA-Industrija nafte d.d. (European Bank for Reconstruction and Development, 2014, p. 6; Rajal and Santic, 2015, p. 57).

Production

The production of most mineral commodities increased in 2014 compared with their production levels in 2013. The mineral commodities for which output increased significantly in 2014 included bentonite, for which output increased by about 36%; silica sand, by 25%; crude steel, by 24%; sulfur, by 22%; rolled aluminum, by 20%; dimension stone, by 15%; lime, by 11%; nitrogen, by 10%; and sand and gravel, by 9%. Salt production decreased by 22%. Mineral fuels, including natural gas and petroleum, were produced, but their output levels were not sufficient to wholly meet domestic fuel demand. Crude petroleum output in 2014 decreased by 10% compared with 2013, and natural gas output decreased by 3% (table 1; Croatia.eu, 2014; European Commission, 2014a, p. 82).

In 2014, total mining and quarrying production (by volume) decreased by 6.4%; mining support services activities, by 5.6%; and energy, by 6.2%, while manufacturing output (by volume) increased by 3.1%. The manufacture of coke and refined petroleum products decreased by 13.2%; the manufacture of fabricated metal products, except machinery and equipment, by 5.9%; and the extraction of crude petroleum and natural gas, by 5.7%. The manufacture of basic metals increased by 8.7%; the manufacture of chemicals and chemical products, by 2.8%; and the manufacture of nonmetallic mineral products, by 0.9%. Mineral fuels including petroleum, natural gas, and condensate were estimated to have accounted for most of the total value of mineral production in Croatia. Industrial minerals, including construction stone, dimension stone, and carbonate mineral raw materials for industrial processing, made up only a small share of total mineral output (by value) (Lismore-Scott, 2013; Croatian Bureau of Statistics, 2015b, p. 17, 18).

Structure of the Mineral Industry

All mineral producers were wholly privately owned, except for mineral fuel producer INA-Industrija nafte d.d. (INA) and fertilizer producer Petrokemija d.d. INA was jointly owned by the Government (44.84%), Magyar Olaj-és Gázipari (MOL) Group of Hungary (49.08%), and others (6.08%). Petrokemija was jointly owned by the Government (43.8%), pension funds (27.6%) and others (28.6%). The leading mineral production companies were aluminum producers TLM–TVP d.o.o. and TLM–TPP d.o.o., each of which was owned by Fintrust Holding GmbH of Austria; iron and steel producers ABS Sisak d.o.o. (owned by Danieli Group of Italy), and Adria Steel Ltd. (owned by Techcom GmbH of Germany); and cement producers Cemex Hrvatska d.d. (owned by CEMEX S.A.B. de C.V. of Mexico) and Holcim (Hrvatska) d.o.o. (owned by Holcim Ltd. of Switzerland) (table 2; Petrokemija d.d., 2014b, p. 2; INA-Industrija nafte d.d., 2015c).

Mineral Trade

Croatia's imports continued to exceed its exports, but the country's trade deficit decreased by 11.1% to $9.1 billion in 2014. The ratio of exports to imports increased to 0.605 from 0.581 in 2013. Total exports increased by 9.0% to $13.8 billion in 2014, whereas total imports increased by 4.5% to $22.9 billion. Mineral fuels and lubricants remained Croatia's second leading import category (by value). Mineral commodity exports were insignificant to the economy, with the exception of coke and refined petroleum products, in large part owing to the loss of competitiveness experienced by the country's minerals industry from 2008 to 2012, the years immediately preceding Croatia's accession to the EU (European Commission, 2014b, p. 26; Croatian Bureau of Statistics, 2015a).

In 2014, Croatia imported about HRK11.2 billion ($1.95 billion)[1] worth of mining and quarrying products, including crude petroleum and natural gas, which was a decrease of 32% compared with that of 2013. The country exported about HRK1.0 billion ($174 million) worth of mining and quarrying products in 2014, which was a decrease of 19.2% compared with that of 2013. Imports of nonmetallic mineral products increased by 7.6% to HRK2.3 billion ($400 million) in 2014. Imports of base metals decreased by 1.8% in 2014 to HRK7.0 billion ($1.2 billion), and imports of fabricated metal products, except machinery and equipment, by 0.7% to HRK4.3 billion ($748 million) compared with 2013. Exports of fabricated metal products except machinery and equipment increased by 1.2% to HRK5.0 billion ($870 million); that of nonmetallic mineral products, by 3.4% to HRK3.0 billion ($522 million); and base metals, by 9.4% to HRK2.9 billion ($504 million) (Croatian Bureau of Statistics, 2015a).

Mineral fuel imports amounted to HRK24.2 billion ($4.2 billion) in 2014, which was a decrease of 10.6% compared with 2013, whereas mineral fuel exports were worth HRK10.6 billion ($1.8 billion), which was an increase of 4.6% compared with 2013. Imports and exports of coke and refined petroleum products were significant in terms of their effect on the national economy and on domestic energy consumption. Imports of coke and refined petroleum products were valued at about HRK9.4 billion ($1.6 billion), which was an increase of 26% compared with 2013, and accounted for 7.2% of total imports. Exports of coke and refined petroleum products amounted to HRK7.1 billion ($1.2 billion), which was a decrease of 6.7%, and made up 9% of total exports (Croatian Bureau of Statistics, 2015a).

Other EU member states continued to be Croatia's leading trade partners, accounting for 63.9% of its exports and 76.4% of its imports in 2014. Croatia's exports to the EU member states increased by 12.7% and imports from the EU member states increased by 8.0% in 2014 compared with 2013. Italy accounted for 13.9% of Croatia's exports, followed by Bosnia and Herzegovina (11.8%), Slovenia (11.4%), Germany (11.2%), and Austria (6.1%). In terms of imports, Germany had the biggest share (15.1%), followed by Italy (14.3%), Slovenia (10.8%), Austria (8.7%), and Hungary (6.6%) (Croatian Bureau of Statistics, 2015a).

Croatia's exports to the United States were valued at $462.6 million in 2014. Mineral exports to the United States included, in order of value, stone, sand, and cement, $9.9 million; petroleum products, except fuel oil, $4.6 million; precious metals, $2.8 million; finished metal shapes, $1.2 million; and iron and steel, $507,000. Croatia's imports from the United States were valued at $339.6 million. Mineral imports from the United States included, in order of value, coal, $184.8 million; finished metal shapes, $2.2 million; precious metals, $629,000; and petroleum products, except fuel oil, $526,000 (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Aluminum.—TLM–TVP was a niche producer of aluminum rolled products and TLM–TPP was a niche producer of aluminum extrusion products. The majority ownership of TLM–TVP was sold by Hypo Alpe-Adria-Bank International AG (HAA) of Austria to EURIS Handel GMbH of Austria (which was a subsidiary of Fintrust Holding GmbH) in August 2012 following a restructuring program undertaken in 2011. The company operated the 100,000 metric tons per year (t/yr) capacity aluminum rolled-product plant at Sibenik in southern Croatia, which produced about 70,000 t/yr of hot- and cold-rolled goods, such as hot-rolled strips, cold-rolled sheets and strips, circles, and thin strips as well as aluminum foil for the construction, packaging, and distribution industries. In 2010, TLM–TVP completed a two-stage mill upgrade at the plant that added a constant-force ironing roll to the thin-strip mill and upgraded the intermediate foil mill exit table. TLM–TPP produced standard tubes, bars, and profiles, and its aluminum extrusion plant at Sibenik had a production capacity of 10,000 t/yr. About 80% of TLM–TVP and TLM–TPP's total output was exported (Parkegate Ltd., 2010; Georgiev, 2012; Fintrust Holding GmbH, 2013).

Iron and Steel.—Croatia's total crude steel production increased in 2014, but sharply decreased in the final quarter of the year. The 29.6% decrease in output registered in the fourth quarter compared with the same period in 2013 was the largest decrease recorded among 65 countries that accounted for 98% of global steel production (Pavic, 2014; World Steel Association, 2015, p. 2).

Croatia's two leading steel producers were ABS Sisak, owned by the Danieli Group since June 2012, and Adria Steel, owned by Techcom GmbH since July 2013. ABS Sisak's plant at Sisak, where operations were restarted in 2013 and whose mill was revamped with partial financing provided by the European Bank for Reconstruction and Development, produced semifinished steel products that were transported to ABS' main facilities at Udine, Italy; Germany; and other European markets. Adria Steel's exports to Algeria, which was one of the company's main sales markets, were reduced in 2013 and 2014 following Croatia's accession to the EU owing to the absence of formal adoption of Euro-Mediterranean Association Agreements between the EU and Algeria by the Government of Croatia. At the end of 2014, a dispute over new employment contracts raised the possibility that Adria Steel would declare bankruptcy for the third time in 2015 (Daskalovic, 2013a, b; Stainless Steel World, 2013; Pavic, 2015).

Industrial Minerals

Cement.—Total cement consumption in Croatia and the neighboring countries of Bosnia and Herzegovina and Montenegro decreased by 1.5% to reach 2.8 million metric tons (Mt) in 2014 according to estimates by global cement producer CEMEX. Cemex Hrvatska continued to be the largest cement producer in Croatia with a total installed capacity of

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[1] Where necessary, values have been converted from Croatian kuna (HRK) to U.S. dollars (US$) at an average rate of HRK0.17= US$1.00 for 2014.

2.4 million metric tons per year (Mt/yr), although this was down from 2.6 Mt/yr in 2013. Of its three cement plants, which are located in Sveti Juraj, Sveti Kajo, and Kolovoz on the Dalmatian coast, the company operated only its biggest plant, Sveti Juraj, owing to inventory levels. Cemex Hrvatska achieved its highest level of output of ready-mix concrete from its eight ready-mix concrete facilities. In 2014, the company continued to contest in court the master plans for development designed by the cities of Kastela and Solin, which the company stated would adversely affect mining concessions it has held in nearby areas since September 2005 (CEMEX S.A.B. de C.V., 2015a, p. 6, 125; 2015b, p. 75).

Holcim (Hrvatska)'s cement and clinker sales decreased by about 11% in 2014. The company operated at a loss for the sixth consecutive year since the economic downturn of 2008 owing to a decrease in demand for cement used in building construction and other civil construction projects. Holcim (Hrvatska) expected to return to profitability in 2015 through the sale, closure, or leasing of its unprofitable concrete-producing assets (Global Cement, 2014, 2015).

Nexe Grupa d.d., which was the owner of the cement and other building materials producer Nasicecement d.d., declared bankruptcy in February 2013. The company's prebankruptcy settlement plan for recapitalization was approved by its creditors in June 2014 (Global Cement, 2013; Insight Information Services, 2014).

Nitrogen.—Petrokemija, whose fertilizer output included ammonia, calcium ammonium nitrate, nitric acid, NPK fertilizers, and urea, produced about 1.1 Mt of fertilizers in 2014, an increase of 0.7% compared with 2013. About 79% of the company's output was exported, particularly to such European countries as Austria, France, Germany, Spain, and Turkey. Exports decreased by 1.8% in 2014 compared with 2013, while domestic sales decreased by 13.1%. Petrokemija's plants operated below capacity owing to lower sales volume and a decrease in revenue caused by the significant decrease in global prices for fertilizer in 2014. The company has not produced carbon black since 2009 owing to a lack of adequate demand for the product (Petrokemija d.d., 2014b, p. 33; 2015a, p. 1; 2015b, p. 6).

Petrokemija launched a recapitalization program in 2013 and a restructuring process in 2014 to increase capital funds for investment and to achieve operational profitability. The Government's ownership share in the company decreased from 50.6% to 43.8% in 2013. According to the "Program of Restructuring and Financial Consolidation of Petrokemija Plc. from 2014–2018," Petrokemija would focus on three main product groups with an annual production volume of 1.05 Mt/yr, increase productivity by 35%, achieve cost reduction in the procurement of strategic raw materials, modernize its ammonia plant to reduce energy consumption by 10%, and access the open market in natural gas to obtain a lower average price for gas. The company's objective was to achieve a sustainable profit margin of 10% by 2018 (Petrokemija d.d., 2014a, p. 2; 2014c, p. 2, 5, 6).

Mineral Fuels

In 2013 (the latest year for which data were available), Croatia's gross inland energy consumption was supplied by petroleum (41%), followed by natural gas (29%), coal (9%), hydropower (9%), and biomass (6%). Hydropower sources provided almost one-half of electricity generation. The country was dependent on energy imports for about 53% of its needs. The Government's Strategy of Energy Development of October 2009 sought to increase the share of power generation by renewable energy sources to 20% by 2020; their share was 16.7% in 2012, which was above the Government's interim target (European Bank for Reconstruction and Development, 2013, p. 12; European Commission, 2014a, p. 82; 2015b, p. 79, 80).

Natural Gas and Petroleum.—Domestic production of crude petroleum, which was primarily based in the regions of Slavonia and Podravina, provided about 19% of Croatia's petroleum consumption. Domestic production of natural gas covered about 65% of domestic consumption (Croatia.eu, 2014; European Commission, 2015b, p. 79, 80).

INA, which was a medium-sized, Croatia-based petroleum and gas company with operations also in Angola and Egypt, was involved in natural gas and petroleum exploration and production, petroleum refining, and petroleum products distribution. Its hydrocarbon exploration and production activities were conducted both offshore in the Adriatic Sea and onshore in the Pannonian basin. In 2014, the company reported onshore reserves of 167.7 million barrels (Mbbl) of oil equivalent and onshore production of 24,060 barrels per day (bbl/d) of oil equivalent. Its offshore reserves in the North Adriatic Sea were 27.2 Mbbl of oil equivalent, and its offshore production amounted to 11,140 bbl/d. INA's total onshore production in 2014 was 8,900 bbl/d of crude oil, which was an increase of 3.7% compared with 2013, 2,100 bbl/d of condensate (a decrease of 11.3% compared with 2013), and 29.7 million cubic meters of natural gas (a decrease of 8.9% compared with 2013). The company's offshore production in Croatia amounted to 25.5 million cubic meters of natural gas (INA-Industrija nafte d.d., 2015a, p. 13, 14, 15).

In 2014, INA drilled eight new exploration wells—all onshore. The company reported that two oil wells and five natural gas wells had yielded positive results. In November INAgip, which was a joint operating company of INA and Eni of Italy, finished development of the Ika JZ gasfield in the Adriatic Sea and began test production. Production from the Ika JZ field was expected to mitigate the decline of gas production from other fields offshore. In July, EDINA, which was a joint operating company of INA and Edison, began gas production at the Izabela gas field. In September, INA delayed a decision on whether to close its Sisak refinery, which along with the company's larger Rjeka refinery operated at a loss owing in part to lower demand for refinery products in the Balkan region. The company's two largest shareholders, MOL Group of Hungary and the Government of Croatia, were unable to reach an agreement on the refineries issue (Kuzmanovic, 2014; INA-Industrija nafte d.d., 2015a, p. 13, 15, 16; 2015b, p. 11, 12).

The Government launched the first international offshore licensing round in April 2014 for exploration of 29 blocks of between 1,000 and 1,600 square kilometers (km^2) each in Croatia's territorial waters in the North, Central, and South Adriatic Sea, covering a total area of approximately 36,800 km^2.

The application period closed in November 2014 and selections were expected in January 2015. The Government subsequently launched the first international onshore licensing round in July 2014 for the exploration of six blocks in the continental regions of Drava, East Slavonia, and Sava, covering an area of approximately 15,000 km^2. The application period would close in February 2015 and licenses were to be awarded in March 2015. Licenses would be granted for a maximum of 30 years, which covered both the exploration phase of up to 5 years and the production phase. The royalty rate to be paid by a company that entered into a production-sharing agreement for hydrocarbons with the Government was set at 10% (Maćešić and Manovelo, 2014a, b; Rajal and Santic, 2015, p. 59).

Outlook

Croatia is expected to remain a modest producer of a limited number of mineral commodities in the near future. Increases in metal and industrial mineral output could materialize as the country's aluminum, cement, nitrogen, and steel production facilities are modernized, but this is also contingent on increased demand for such commodities in both Croatia and its main export markets in Europe. Mineral fuels are expected to remain the most economically significant output of Croatia's minerals industry; however, the country's refinery products output may decrease substantially if either of INA's unprofitable refineries is closed. Expected offshore and onshore hydrocarbon exploration in 2015 has the potential to turn the country into a significant mineral fuels producer. The planned liquefied natural gas terminal on the island of Krk in the North Adriatic Sea and the Ionian-Adriatic natural gas pipeline are expected to establish Croatia as a key chain in the Balkan and European energy supply corridors. The planned Plomin C 500-megawatt coal-fired thermal powerplant in Istria is likely to generate additional demand for construction aggregates in the coming years and for coal upon completion in 2019 (Maćešić and Manovelo, 2014a; Rajal and Santic, 2015, p. 60, 61).

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TABLE 1
CROATIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Alloys		20,974	36,988	41,772	33,692	34,000 [e]
Semimanufactures:[e]						
Extruded		6,000	8,000	8,000	8,000	8,000
Rolled		50,000	60,000	69,924 [2]	161,763 [r, 2]	193,832
Total[3]		56,000	68,000	77,924 [r]	169,763 [r]	201,832
Steel:						
Crude, from electric furnaces[e]		95,000	96,000	1,000	135,000 [r]	167,000
Semimanufactures, hot rolled[e]		94,704 [r]	95,908 [r]	1,016 [r]	110,602 [r]	137,000
INDUSTRIAL MINERALS						
Cement:						
Portland cement	thousand metric tons	2,682	2,577	2,154	2,333	2,345
Other hydraulic cement	do.	93	105	100	103	100 [e]
Total hydraulic cement[3]	do.	2,775	2,682 [r]	2,254 [r]	2,436	2,445
Clays:						
Bentonite		--	--	--	24,129	32,751
Ceramic clay		97,237	67,914	86,303	69,619	70,000 [e]
Clinker	thousand metric tons	2,116	2,072	1,999	2,210	2,226
Gypsum and anhydrite, crude		197,606	167,518	182,557	114,450	120,055
Lime	thousand metric tons	240	254	207	185	205
Nitrogen, N content of ammonia	do.	361	368	342	343	376
Pumice and related materials, volcanic tuff[e]	do.	15	15	20	20	20
Salt, all sources		66,835	55,963	46,000	42,502	33,039
Sand and gravel, excluding glass sand	thousand metric tons	3,500 [e]	4,003	3,683	3,199	3,497
Silica sand (quartz, quartzite, glass sand)		240,919	227,437	106,276	102,070	127,276
Stone:						
Crushed and brown	thousand metric tons	13,270	13,033	11,152	12,409	12,989
Dimension stone		1,200,000 [e]	1,400,000 [e]	1,028,230	973,784	1,115,535
Sulfur, byproduct of petroleum		6,834	7,254	17,411	15,902	19,384
MINERAL FUELS AND RELATED MATERIALS						
Natural gas, gross production	million cubic meters	2,727	1,872	2,013	1,862	1,804
Petroleum:						
Crude, gross weight, includes condensate	thousand 42-gallon barrels	5,344	4,929	4,605	4,605	4,142
Refinery products:						
Distillate fuel oil	do.	9,750	8,437	13,790	12,799 [r]	11,500 [e]
Residual fuel oil	do.	5,788	4,868	3,363	3,032 [r]	2,700 [e]
Jet fuel	do.	752	942	776	870 [r]	780 [e]
Liquefied petroleum gases	do.	2,854	2,482	1,865	1,965 [r]	1,800 [e]
Motor gasoline	do.	10,940	8,710	10,841	10,041 [r]	9,000 [e]
Other products	do.	5,256	5,400 [e]	5,600 [e]	5,700 [e]	5,100 [e]
Total	do.	35,340	30,839	36,235	34,407 [r]	30,900 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through August 6, 2015.

[2] Reported figure.

[3] Data may not add to totals shown because of independent rounding.

TABLE 2
CROATIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, semimanufactures		TLM-TVP d.o.o. (Fintrust Holding GmbH, 100%)	Sibenik	100 [e]
Do.		do.	do.	10
Do.		Top-Tvornica Olovni Proizvoda Aluminijskih d.d.	Sveta Nedjelja	NA
Do.		Ivanal d.o.o.	Sibenik	3
Carbon black[1]	metric tons	Petrokemija d.d. (Government, 43.8%; pension funds, 27.6%; others, 28.6%)	Plant at Kutina	32,000
Cement		Cemex Hrvatska d.d. (CEMEX S.A.B. de C.V., 100%)	Plants at Sveti Juraj, Sveti Kajo, and Kolovoz	2,400
Do.		Holcim (Hrvatska) d.o.o. (Holcim Ltd., 100%)	Plant at Koromacno	1,000
Do.		Calucem d.o.o (CALUCEM Group)	Plant at Pula	NA
Do.		Tvornica Cementa Umag d.o.o. (Istramineral Umag d.o.o., 100%)	Cement plant at Umag	350
Do.		Nasicecement d.d. (Nexe Grupa d.d.)	Nasice	680
Fertilizer, of which:				
Ammonia		Petrokemija d.d. (Government, 43.8%; pension funds, 27.6%; others, 28.6%)	Plant at Kutina	450
Calcium ammonium nitrate		do.	do.	400
Nitric acid		do.	do.	415
NPK fertilizer		do.	do.	600
Urea		do.	do.	500
Natural gas	million cubic meters	INA-Industrija nafte d.d. (MOL Group, 49.08%; Government, 44.84%; others, 6.08%)	Natural gasfields at Ika JZ, Izabela, Molve, offshore platforms in the Adriatic Sea, and other locations	2,000 [e]
Petroleum:				
Crude	thousand 42-gallon barrels per day	do.	Oilfields at Kalinovac, Sandrovac, Struzec, Zutica, and other locations	25 [e]
Refined	do.	do.	Refinery at Rijeka (Urinj)	90,370
Do.	do.	do.	Refinery at Sisak	44,000
Salt	metric tons	Solana Pag d.d.	Pag Island (marine salt)	15,000
Do.	do.	Small producers	Ston, Nin	5,000
Steel, crude		ABS Sisak d.o.o. (Danieli Group, 100%)	Plant at Sisak	324
Do.		Adria Steel Ltd. (Techcom GmbH, 100%)[2]	Plant at Split	50

[e] Estimated. Do., do. Ditto. NA Not available.

[1] No carbon black has been produced in Croatia since 2009.

[2] Previously known as Zeljezara Split d.d. Stopped production in 2009. Production resumed in 2013.

THE MINERAL INDUSTRY OF CYPRUS

By Sinan Hastorun

Cyprus is a moderately developed country that is strategically located in the eastern Mediterranean region between southern Europe, the Middle East, and North Africa. The third largest island in the Mediterranean Sea, Cyprus is situated 75 kilometers (km) south of Turkey, 105 km west of Syria, and 380 km north of Egypt. Only copper cathodes and industrial minerals used in construction, such as sand and stone, were produced in 2014. The production of other minerals, such as asbestos fibers, chromite, copper, gold, and iron pyrites, largely ceased after the political division of the island in 1974. The mineral resources of Cyprus[1] include asbestos, bentonite, copper, crushed limestone (known locally as havara), gypsum, lime, marble, sand and gravel, and umber, which is a pigment that contains iron oxide. The island accounted for almost 1% of world bentonite production in 2014. The mining and quarrying sector as a whole accounted for less than 1% of national economic output. The rate of decrease in mineral output slowed to 11% in 2014 after the economic crisis of the Spring of 2013 sharply reduced business investment in all sectors. There was increased exploration for metals (such as copper, gold, and zinc), industrial minerals, and mineral fuels (particularly natural gas) offshore (Ministry of Agriculture, Natural Resources, and Environment, 2005, p. 28, 29; Embassy of the Republic of Cyprus, 2014; Mines Service, 2015a, b, f, g, i; Statistical Service, 2015g; Flanagan, 2016, p. 51).

Cyprus had no measured resources of mineral fuels; however, there was ongoing offshore exploration in the country's Exclusive Economic Zone (EEZ) in the Mediterranean Sea. Natural gas deposits were identified at the Aphrodite gasfield offshore southern Cyprus in 2011. Following the Aphrodite discovery, four foreign companies obtained licenses in 2012 and 2013 for offshore hydrocarbon exploration in the Cyprus EEZ, which is located in the Levant Basin province of the eastern Mediterranean Sea. Exploration and appraisal drillings were undertaken in other EEZ blocks in 2013 and 2014, with further activity expected in 2015 to ascertain total natural gas and petroleum reserves offshore (U.S. Energy Information Administration, 2013, p. 6; 2014; Kouppas and others, 2015, p. 64).

The island is subdivided into four geologic zones: the Keryneia Terrane range in northern Cyprus, the Circum Troodos plain in the east and south, the Mamonia Terrane complex in the southwest, and the Troodos Terrane chain in the center. The Troodos Ophiolite complex contains the bulk of the island's ore deposits, such as asbestos, chromite, copper, gold, iron pyrites, and silver. The Keryneia range contains dolomites, limestones, and marbles. The Circum Troodos sedimentary succession consists of bentonitic clays, cherts, limestones, and marls (van der Meer, 1996; Geological Survey Department, 2014).

Minerals in the National Economy

In 2014, Cyprus's real gross domestic product (GDP) decreased by 2.5% compared with a 5.9% decrease in 2013 owing to the banking and subsequent economic crisis. The nominal GDP was $23.2 billion in 2014, which was down from $24.1 billion (revised) in 2013. The decrease in the rate of contraction of the economy was mainly owing to an increase in private consumption, which had sharply decreased in 2013. Net exports made a negative contribution to growth owing to an increase in imports, which also had decreased in 2013. Construction also contributed negatively to growth on the supply side (European Commission, 2015b, p. 90; International Monetary Fund, 2015, p. 5; Statistical Service, 2015g; World Bank, The, 2015).

Most sectors of the economy, including the mineral sector, contracted at a lower rate than they did in 2013, while industrial output stopped decreasing. The gross value added (in constant dollars) by the mining and quarrying sector was 15.7 million euros (EUR) ($20 million[2]) in 2014, which was a decrease of 11.7% compared with the gross value added of EUR17.8 million ($22.7 million) (revised) in 2013. The gross value added by the manufacturing sector, which included the manufacture of various minerals, decreased by 1.6% to EUR723.7 million ($923.1 million) in 2014 from EUR738.2 million ($942.8 million) (revised) in 2013. The share of mining and quarrying as a percentage of the country's total value added decreased to 0.12% in 2014 from 0.13% (revised) in 2013, whereas that of manufacturing remained at 5.3% (Statistical Service, 2015e, g).

In 2013 (the latest year for which comprehensive data were available), the gross value added (in current dollars) by the manufacturing sector amounted to EUR832 million ($1.06 billion). Within the manufacturing sector, the value added by the manufacture of fabricated metal products, except machinery and equipment, was EUR73.1 million ($93.4 million), or 8.8% of the total gross value added by the sector; the manufacture of other nonmetallic mineral products was EUR70.7 million ($90.3 million) or 8.5% of the sector total; the manufacture of base metals, EUR24.4 million ($31.2 million) or 2.9%; and the manufacture of chemicals and chemical products, EUR22.9 million ($29.2 million) or 2.8% (Statistical Service, 2015f).

Total industry employment decreased by about 10% to 32,908 workers in 2013 (the latest year for which data were available) from 36,485 workers in 2012. Mining and quarrying, together with electricity generation and distribution, employed 2,747 workers in 2013 (the latest year for which data were available), which was a decrease of 7% from the 2,892 workers employed in the two sectors in 2012. Manufacturing employed 28,506 workers, which was down by about 11% from the 31,933 workers employed in 2012. Within the manufacturing sector, the manufacture of fabricated metal products except machinery and equipment employed 3,388 workers (which was down from 4,061 in 2012); the manufacture of other nonmetallic mineral products, 2,118 workers (down from 2,562 in 2012); the manufacture of chemicals and chemical products, 670 workers (down from 749); and the manufacture of base metals, 316 workers (down from 365) (Statistical Service, 2015f).

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[1] Unless specifically stated, all data in this chapter are for the Republic of Cyprus, which is located in the southern part of Cyprus, because data related to northern Cyprus, which is administered by Turkish Cypriots, were sparse or unavailable. The two areas have been politically separated since 1974.

[2] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average exchange rate of EUR0.784=US$1.00 for 2014 and EUR0.783=US$1.00 for 2013.

Government Policies and Programs

The Mines Service of the Ministry of Agriculture, Natural Resources, and Environment is the regulatory authority for mines and quarries in Cyprus. It administers the Mines and Quarries (Regulation) law No. 5 of 1965, as amended by law No. 88(I) of 1995, No. 132(I) of 2001, and No. 63(I) of 2003, and the Explosive Substances Law and Regulations. The Mines Service is responsible for issuing prospecting permits, quarry licenses, and mining leases; examining environmental studies submitted to assess the environmental impact of extraction activities; supervising health and safety in mines and quarries; controlling the importation, storage, sale, and use of explosive substances and ammunitions; and collecting royalty and fee payments. The Service also advises the Government on technical subjects related to the minerals of Cyprus (Mines Service, 2015d, e, k).

Mineral fuels exploration and extraction activities in Cyprus are governed by the Hydrocarbon Prospection, Exploration and Exploitation Law No. 4(I)/2007 of 2007, as amended by laws No. 126(I)/2013 of 2013 and No. 29(I)/2014 of 2014, and the Hydrocarbon Regulations of 2007 and 2009 (No. 51/2007 and No. 113/2009). The law and the two regulations implement European Commission Directive 94/22/EC of May 30, 1994 on the conditions for granting authorization for hydrocarbon prospecting, exploration, and production. The Ministry of Energy, Industry, Commerce, and Tourism (MCIT) grants entities mineral rights for the development of natural gas and petroleum reserves through three separate authorizations for upstream activities. A prospecting license is valid for up to 1 year. An exploration license does not exceed 3 years but can be renewed up to two times. An exploitation license is valid for up to 25 years and can be renewed for another 10 years. The MCIT issues Model Production-Sharing Contracts (MPSC) for contracted areas that specify minimum work obligations, development and production plans, and fiscal provisions regarding payments of royalties and formulas for the cost of recovery and profit sharing between the Government and the private contracting party (Antoniou, 2014; Kouppas and others, 2015, p. 64).

Production

In 2014, there was great variation in the changes observed in Cyprus's production of mineral commodities, with a number of minerals showing significant increases or decreases in output. Production increased for marble, granules, and chippings by 129% compared with that of 2013; crushed limestone (known locally as havara), by 111%; marl, by 30%; clinker and clays for cement manufacture, by 29% each; and crude gypsum, by 10%. Production of umber and ocher for cement production decreased by 64%; calcined gypsum, by 30%; clays for brick and tile manufacture, by 19%; refined copper, by 15%; hydraulic cement, by 14%; building stone, by 13%; and bentonite and sand and gravel, by 11% each. No natural gas or petroleum were produced onshore or offshore (table 1).

Mining and quarrying output decreased by 12% in 2014 compared with its level in 2013. The manufacture of nonmetallic mineral products decreased by 12.4% and the manufacture of base metals and fabricated metal products, by 10.6%. The manufacture of refined petroleum products, chemicals, and chemical products increased by 6.6% in 2014 (Statistical Service, 2015d).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities, their locations, and their annual capacities. All facilities were privately owned.

Mineral Trade

Cyprus's imports continued to exceed its exports by a wide margin, and the trade deficit increased by 11.1% to EUR3.69 billion ($4.71 billion) in 2014. The ratio of exports to imports decreased to 0.281 from 0.333 in 2013. Total exports decreased by 10.6% to EUR1.44 billion ($1.84 billion) in 2014, whereas total imports increased by 6.2% to EUR5.13 billion ($6.54 billion). Fuels and lubricants continued to be the second-ranked category of Cyprus's imports, accounting for 23.9% of all imports, which was down from 28.1% in 2013. Among exports, industrial products of mineral origin accounted for 3.7% of total exports, down from 4.5% in 2013. Mineral commodities accounted for only 0.8% of Cyprus's exports compared with 0.9% in 2013 (Statistical Service, 2015a, b).

The major exported mineral commodities of Cyprus were bentonite, building stone, cement, clinker, copper, gypsum, lime, plasters, and umber and ocher. Exports of copper cathodes decreased by 15% to 3,088 metric tons (t) in 2014 from 3,631 t in 2013, while exports of cement decreased by 21% to 268,098 t in 2014 from 339,374 t in 2013. Exports of clinker, which is a new export commodity since 2012, were 1.1 million metric tons (Mt) in 2014, which was up significantly from the 807,041 t exported in 2013 and 23,363 t in 2012, in part owing to decreasing domestic demand. Gypsum exports were estimated to be 170,000 t; bentonite, 150,000 t; umber and ocher, 6,000 t; and building stone, 3,000 t (Mines Service, 2015b, f, i; Statistical Service, 2015h).

Cyprus was almost entirely dependent on mineral fuel imports to meet its energy needs. In 2013 (the latest year for which data were available), about 95.5% of the country's energy supply was provided by petroleum products, which were 100% imported. Solar energy accounted for the remaining 4.5%. As a result, Cyprus's energy trade deficit, which was equal to 7.5% of the GDP, was the second highest deficit among the 28 member states of the European Union (EU) after Malta (European Commission, 2013, p. 154; 2015c, p. 93, 94).

Other EU member states continued to account for the bulk of Cyprus's trade, commanding a 70.5% share of its imports and a 41.7% share of its exports. Cyprus's principal trading partners included Greece (which received 15.2% of Cyprus's exports), the United Kingdom (9.4%), Israel (5.4%), the United States (3.3%), China (2.7%), Germany (2.5%), and Egypt (2.4%) for exports. Its main sources of imports were Greece (which provided 23.5% of Cyprus's imports), Israel (9.5%), the United Kingdom (7.3%), Italy (7.1%), Germany (6.9%), the Netherlands (5.7%), and France (5.5%) (Statistical Service, 2015c).

In 2014, Cyprus's exports to the United States were valued at $64.0 million compared with $43.5 million in 2013. Cyprus's mineral exports included $1,103,000 in sulfur and nonmetallic minerals. Cyprus's imports from the United States were valued at $151.7 million in 2014 compared with $143.2 million in 2013. Cyprus's mineral imports included, in descending order of value, $4.9 million in fuel oil, $2.5 million in finished metal shapes, $1.5 million in iron and steel mill products; $1.1 million in petroleum products; $826,000 in chemicals; $442,000 in copper, and $299,000 in fertilizers (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Copper.—The Skouriotissa Mine, which was operated by Hellenic Copper Mines Ltd., remained the only active copper mine in Cyprus. Thirty-three other copper and gold mines, which are located in the districts of Larnaca, Limassol, Nicosia, and Paphos, and some of which had been active since as early as the 1920s, ceased operations by 1996 and remained inactive. The Skouriotissa Mine produced 99.99% purity copper cathodes by a leaching-solvent extraction-electrowinning process. Hellenic Copper Mines planned to begin mining the copper deposits of Apliki, which is near the town of Kalopanagiotis, in the district of Nicosia in 2015 (Mines Service, 2015a, d, h, i).

EMED Mining Public Ltd. held 10 exploration licenses totaling 32.7 square kilometers (km^2) in the Troodos Ophiolite complex. Three licensed areas were found to contain more than 10 Mt of reserves at grades of between 1.0% and 4.5% copper. The Klirou copper-zinc prospect, which is located 20 km southwest of Nicosia, was reported to have inferred resources of 6.6 Mt at a grade of 0.7% copper, as well as associated gold. Contained metal estimates at Klirou were 18,500 t of copper and 53,600 t of zinc. At the end of 2014, EMED was in joint-venture discussions with other mineral exploration companies to proceed to the next stage of the project (EMED Mining Public Ltd., 2007; 2014; 2015, p. 12).

Gold.—BMG Resources Ltd. of Australia continued to explore for gold, silver, copper, cobalt, and zinc in the Troodos Mountains. The company held 15 exploration and reconnaissance licenses covering 122 km^2 with four project areas: Black Pine, 8 licenses covering 79.3 km^2; Kalavassos, 1 license covering 10.2 km^2; Kambia, 3 licenses covering 8.7 km^2; and Vrechia, 3 licenses covering 23.6 km^2. During 2014, BMG conducted 911 meters (m) of drilling in the Pevkos Prospect of Black Pine and intersected copper-gold-nickel-cobalt sulfides. The highest grade sample from drilling was 2 m at 3.00 grams per ton (g/t) gold, 0.33% copper, 3.03% nickel, and 0.16% cobalt from 94 m depth. In 2014, BMG relinquished a number of licenses at the Kambia project following an evaluation of previous reports to focus on developing high-quality drill targets at Kokkinochoma, North Mathiatas, and Pitharachoma. The company also completed 13 drill holes for a total of 1,092 m at the Mala open pit of the Vrechia project in order to confirm copper-zinc grades obtained in past drilling and to determine the presence of gold-silver deposits. Assay results were pending as of yearend 2014 (BMG Resources Ltd., 2015, p. 4–18).

Northern Lion Gold Corp. of Canada suspended its exploration activities in Cyprus in October 2014 after its joint-venture partner, Centerra Gold Inc. of Canada, terminated its option agreement to earn up to 70% interest in a number of the company's exploration permits located in the districts of Larnaca and Paphos. As part of the 2014 drilling program, Centerra drilled a total of 1,659.5 m in 10 holes from June to August, with nine holes in the Mavroyi area and one hole at the Saramas target, but found no sulfides or alteration (MarketWatch, 2014).

Industrial Minerals

In 2014, quarrying of deposits of building stone, gypsum, limestone, marble, marl, sandstone, umber and ocher, and other industrial minerals was undertaken across the island. A total of 130 quarries were producing various materials, particularly for use by the construction industry. Of these quarries, about 45 were in the final stages of operation or the reclamation phase following the end of production. Twelve quarrying companies were engaged in the production of limestone aggregates; 10 each, bricks and tiles and diabase aggregates; 8, building stone; 6 each, bentonite and crushed limestone (havara); 3 each, fine aggregates and umber; and 1 each, armor stone, crushed marble, gypsum, and ocher. Nearly all were small-scale producers (Mines Service, 2015a, c, f, i, j).

Cement.—Local sales of cement in Cyprus decreased by 15% to 452,647 t in 2014 compared with 534,960 t in 2013. The country's ongoing economic recession and concomitant contraction in construction activity since 2008 has decreased domestic demand for cement each consecutive year. Sales in 2014 were 77% lower than their peak level in 2008 (International Cement Review, 2015a; Statistical Service, 2015h).

Vassiliko Cement Works Public Co. Ltd., the leading producer and distributor of cement and clinker in Cyprus, reported an increase of about 6% in total revenues for 2014. The company continued to expand its sales in overseas markets, which mitigated the decrease in domestic sales. Vassiliko was estimated to have exported 0.28 Mt of cement and 1.16 Mt of clinker in 2014 (International Cement Review, 2015b, p. 113; Vassiliko Cement Works Public Co. Ltd., 2015, p. 11).

Mineral Fuels

Natural Gas and Petroleum.—Hydrocarbon reserves continued to be assessed offshore of southern Cyprus. As of yearend 2014, exploration licenses had been granted for 6 of 13 blocks in Cyprus's EEZ to energy companies from France, Israel, Italy, the Republic of Korea, and the United States following two licensing rounds that were held in 2007 and 2012 (Deloitte Touche Tohmatsu Ltd., 2015, p. 4; Kouppas and others, 2015, p. 64).

Noble Energy International Ltd. of the United States held an exploration and exploitation license for block 12, which contained the Aphrodite gas field, where it identified natural gas deposits in 2011. In June 2013, the Government signed a memorandum of understanding (MOU) with Noble and its drilling partner companies, Delek Drilling L.P. and Avner Oil & Gas Exploration L.P. of Israel, regarding the construction of a liquefied natural gas (LNG) terminal in Vasiliko to store and to export natural gas from Cyprus. In November 2014, Delek Drilling reported a 12% increase in the previously highest estimate of resources in the Aphrodite field to 130 billion cubic meters of natural gas and 9 million barrels of condensate as a result of drilling at the Aphrodite-2 well (Offshore Magazine, 2014; Kouppas and others, 2015, p. 64).

The Eni-KOGAS consortium (a joint venture of Eni S.p.A. of Italy and KOGAS of the Republic of Korea) held exploration licenses for Blocks 2, 3, and 9 and Total S.A. of France for Blocks 10 and 11 offshore of southern Cyprus. The Government issued MPSCs to Eni-KOGAS in January 2013 and to Total in February 2013. In August 2014, Eni-KOGAS signed a MOU with the Government aimed at investigating areas of cooperation including the onshore LNG terminal. The consortium drilled its first exploratory well in September 2013 and conducted its first appraisal drillings in September 2014. In November, the Government announced that results on natural gas reserves from the well at the Onasagoras field inside Block 9 would be available within the next few months. Eni-KOGAS had plans to drill several exploratory wells in 2015 and 2016. Total was expected to drill its first exploratory well in the first half of 2015 (Cyprus Mail, 2014; Deloitte Touche Tohmatsu Ltd., 2015, p. 4; Kouppas and others, 2015, p. 64).

Outlook

Cyprus's economy is forecasted to return to a low rate of positive growth in 2015. Mining and quarrying output is expected to continue to decrease, though at a lower rate, as the contraction of the construction sector and the concomitant decrease in demand for industrial minerals on the island slows down. Copper cathode production is expected to increase with the beginning of mining of deposits at a second site by Hellenic Copper Mines. The exploration of copper and gold deposits by BMG Resources, which was the only active mineral exploration company in Cyprus after Northern Lion suspended its program in late 2014, is at an early stage of development and is not expected to increase metal production in the near future. The ongoing offshore hydrocarbon exploration has the potential to turn Cyprus into a medium-sized mineral fuels producer and exporter. The country's total offshore reserves may be insufficient to make onshore LNG processing and exporting economically feasible as envisioned by the Government as part of its new comprehensive energy strategy to reduce dependence on petroleum imports. Instead, natural gas pipelines may have to be built to other countries, such as Egypt, Greece, Israel, or Turkey (Hadjicostis, 2014; Smith, 2014; European Commission, 2015a, p. 15, 19; International Monetary Fund, 2015, p. 31; Kouppas and others, 2015, p. 63, 64).

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TABLE 1
CYPRUS: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Copper, refined	metric tons	2,595	3,660	4,328	3,631	3,088
Iron oxide pigments, umber and ocher	do.	4,125	3,219	3,394	4,016	3,793
INDUSTRIAL MINERALS						
Cement:						
Hydraulic		1,329	1,207	1,026	855	735
Clinker		1,036 r	1,037 r	953 r	1,418 r	1,826
Umber and ocher	metric tons	52,039	61,553	37,957	57,294	20,743
Clays:						
Bentonite	do.	162,969	160,625	160,180	158,386	140,174
Other:						
For brick and tile manufacture		210	160	120	78	63
For cement manufacture		445	405	375	582	749
Total		655	565	495	660	812
Gypsum:						
Crude	metric tons	333,000	335,000	327,800	315,000	347,600
Calcined	do.	4,100	4,877	4,523	3,679	2,561
Total	do.	337,100	339,877	332,323	318,679	350,161
Lime, hydrated	do.	9,915	9,824	4,551	3,730	3,462
Sand and stone:						
Limestone, crushed (havara and filling materials)	do.	250	165	64	18	38
Marble, granules and chippings		1,195	1,900	3,920	900	2,060
Marl		1,805	1,640	1,500	2,363	3,068
Sand and gravel[3]		12,981	11,826	7,308	4,561	4,039
Stone, building[4]		128	84	89	8	9

r Revised do. Ditto.

[1] Table includes data available through August 20, 2015.

[2] Mineral production from areas of northern Cyprus that are administered by Turkish Cypriots and the production of fertilizers, perlite, and secondary metals from scrap are not included because available information is inadequate to make reliable estimates of output.

[3] Includes crushed aggregate.

[4] Includes crude, semifinished, and worked stone.

TABLE 2
CYPRUS: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, semimanufactures	Muskita Aluminum Industries Ltd.	Plant at Limassol	22,000
Cement	Vassiliko Cement Works Public Co. Ltd. (Church of Cyprus, 26%; Italcementi Group, 25%; Cyprus Cement Public Co. Ltd., 25%)	Plant at Vasiliko, 5 quarries in the area	2,400,000
Do.	Cyprus Cement Public Co. Ltd.	Plant at Moni	430,000
Clay, bentonite	Peletico Penta Ltd.	Mines at Pentakomo and Troulli, plant at Pentakomo	NA
Do.	Drapia Mining Co.	Mines at Drapia, Monagroulli, and Parsata	NA
Do.	Oryktako Ltd.	Mine at Kato Moni and processing plant at Malounda	10,000
Copper, refined	Hellenic Copper Mines Ltd.	Skouriotissa	8,000
Gypsum	Peletico Ltd.	Quarry and processing plant at Aradipou, near Larnaca	NA
Do.	Zeiplast Chemical Industries Ltd.	Near Moni	NA
Perlite	Peletico Ltd.	Expanded perlite facility at Larnaca	NA
Do.	Zeiplast Chemical Industries Ltd.	Expanded perlite facility at Moni	NA
Steel, semimanufactures	B.M.S. Metal Pipes Industries Ltd.	Tube and pipe mill, Paphos	15,000

Do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF THE CZECH REPUBLIC

By Elena Safirova

In 2014, the Czech Republic was estimated to have been the fifth-ranked producer of kaolin (with about 9% of the world's production) and the ninth-ranked producer of feldspar (2.0% of the world's production), by tonnage. The country did not produce metal ore, and the Government faced opposition to gold projects owing to environmental concerns. The country produced crude steel, pig iron, rolled and semimanufactured steel products, and secondary lead and aluminum metals in 2014. Mineral fuel production included coal, which was important to the country's domestic and regional markets; uranium, which was consumed predominantly at domestic nuclear powerplants; and a small amount of crude oil and natural gas (World Steel Association, 2015; Flanagan, 2016; Tanner, 2016).

Minerals in the National Economy

In 2014, the Czech Republic's real gross domestic product (GDP) increased by 2.0%. The nominal GDP amounted to $205.3 billion.[1] The manufacture of fabricated metal products, except machinery and equipment, amounted to 9.2% of the country's industrial production; basic metals, 3.4%; and mining and quarrying, 2.7%. In 2014, the mining and quarrying industry employed 33,000 workers; manufacture of basic metals, 44,000 workers; and manufacture of fabricated metal products, except machinery and equipment, 141,000 workers (Czech Statistical Office, 2015).

In 2014, the Czech Republic's exports and imports amounted to about $174.8 billion and $149.2 billion, respectively. Among the country's exported goods were fabricated metal products, except machinery and equipment, which accounted for 5.6% of the export value; chemicals and chemical products (4.8%), basic metals (4.2%), and other nonmetallic mineral products (1.9%). The Czech Republic's major export partners were Germany, which received 32.0% of the Czech Republic's exports, Slovakia (8.4%), Poland (6.0%), the United Kingdom (5.1%), France (5.0%), Austria (4.3%), Italy (3.7%), the Russian Federation (3.1%), and Hungary (2.8%) (Czech Statistical Office, 2015).

Among the country's imported commodities were chemicals and chemical products, which accounted for 8.1% of all imports, basic metals (7.5%), crude petroleum and natural gas (5.7%), fabricated metal products, except machinery and equipment (4.5%), and other nonmetallic mineral products (1.4%). The Czech Republic's major import partners were Germany, which supplied 27.0% of the Czech Republic's total imports, China (11.7%), Poland (8.0%), Slovakia (5.5%), Italy and the Russian Federation (4.2% each), and the Netherlands (3.5%) (Czech Statistical Office, 2015).

Government Policies and Programs

Members of the lower chamber of the Czech Parliament ordered the Government to ban gold production in the Czech Republic. This measure was proposed by the Parliament Committee on Environment in response to requests for mining licenses to mine gold in 13 towns, including Eseniki, which is located in northern Moravia, and the Kashper Mountains. The committee recommended that the Government keep intact the decree issued in 1999. The decree states that gold production and processing are undesirable activities because of their environmental impact. The Government was to prepare an amendment to the Law on Gold Mining and to prepare a new bill on exploration for gold. The committee did not specify the deadline by which the documents had to be prepared (Catalogmineralov.ru, 2014; Marsheva, 2014).

The Czech Republic had significant gold resources compared with other countries in Europe. According to the Czech Gold Association, the country's gold resources were estimated to be 392 metric tons (t). According to the existing Mining Code, the use of all types of cyanide for leaching and beneficiation purposes is banned. Also, gold has not been explored for or mined in the Czech Republic since 1994, when the Zlate Hory deposit in Northern Moravia was mined. In April, the Ministry of the Environment stated that all requests for exploration or mining licenses were either declined, or, if they were still under consideration, would be declined in the near future (Mineral.ru, 2014; Zolotonews.ru, 2014).

Production

In 2014, production of most mineral products increased. Production of foundry sand increased by 46%; refined petroleum products, by 43%; and bentonite, by 33%. Output of dimension stone increased by 19%; cement and dolomite, by 15% each; nitrogen, by 14%; feldspar substitutes, by 13%; pyrope-bearing rock, by 12.5%; limestone and other clays, by 11.5% each; moldavite-bearing rock, by 11%; hydrated lime and quicklime, by 10.5%; and sulfuric acid, by an estimated 10%. On the other hand, diatomite production decreased by 31%; uranium, by 29%; and secondary aluminum metal, by an estimated 10%. These and other data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Iron and Steel.—According to the World Steel Association, in 2014, the country produced 4.152 million metric tons (Mt) of pig iron and 5.36 Mt of crude steel. During the period between

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[1] Where necessary, values have been converted from Czech korunas (CZK) to U.S. dollars (US$) at an annual average exchange rate of CZK20.75=US$1.00 for 2014 and from euro area euros (EUR) at an annual average exchange rate of EUR0.784=US$1.00 for 2014.

2000 and 2007, the Czech Republic produced between 6 and 7 million metric tons per year (Mt/yr) of crude steel. In 2009, in the midst of the economic crisis, however, production was reduced by almost 35% and still had not reached pre-crisis levels in 2014. The major consumers of the steel industry's products were the automotive and construction sectors. The automotive industry was growing at a modest rate and the demand for flat-rolled steel was increasing slowly; however, the construction sector remained stagnant, and the demand for rebar and similar products remained unchanged (Zaitsev, 2014; World Steel Association, 2015).

The three leaders in Czech metallurgy were ArcelorMittal Ostrava a.s., Moravia Steel/Trinecke Zelezarny, and Vitkovice Steel a.s. ArcelorMittal Ostrava had the capacity to produce 3 Mt/yr of steel and employed 7,500 workers, but it faced low financial returns and had to periodically leave its facilities idle to preserve company profitability. Nevertheless, the company continued to invest in the modernization of its facilities. At yearend 2013, the company announced plans to invest $53 million to modernize its continuous casting machine. In October 2014, ArcelorMittal invested 7.3 million euros ($68 million) to improve its rolling mill for medium castings. This investment would expand the variety of the company's products and produce steel rods with diameters ranging from 15 to 75 millimeters and lengths ranging from 1 to 24 meters. In addition, the company started producing threaded steel rods that were used in construction (Metaltorg.ru, 2014; Zaitsev, 2014).

Moravia Steel/Trinecke Zelezarny was fully owned by Czech investors and specialized in the production of rolled products, semimanufactured products, and seamless pipes, and was the third-ranked producer of rails in Europe. In 2014, the company operated at full capacity and continued to invest in improvements at its production facilities. In 2013, it introduced a new technology that used powdered coal fuels, and in 2014, it planned to introduce a new rebar production line that would modernize its rod mill. Combined, these three projects cost the company about 1 billion euros ($1.28 billion) (Zaitsev, 2014).

The third-leading steel producer, Vitkovice Steel a.s., had a production capacity of 755,000 metric tons per year (t/yr) of rolled flat sheet and 170,000 t/yr of rolled section steel. In 2013 (the last year for which information was available), Vitkovice Steel produced a total of 571,000 t of steel products and employed about 1,000 workers. In April 2014, the Evraz Group of Russia, which had owned the plant since 2005, sold the company to a group of five private investors for $89 million. The new owners (Martinley Holdings Ltd., Nabara Holdings Ltd., Vitect Services Ltd., Hayston Investments Ltd., and Dawnaly Investments Ltd. each owned a 20% share in the company) were responsible for the company's $198 million of debt (MinerJob.ru, 2014; Zaitsev, 2014).

Industrial Minerals

Cement.—In 2014, cement production in the Czech Republic reached 3.691 Mt, which was a 15% increase compared with 2013. Domestic cement consumption increased by 5% to reach 3.572 Mt. In real terms, construction output increased by 2.3% year-on-year, led primarily by civil engineering construction. Domestic production and consumption dominated the Czech cement market; exports constituted only 602,000 t, or 16.3%, of production, and imports amounted to 455,000 t, or 12.3%, of total consumption. In 2015, cement consumption was expected to increase by another 5% (European Cement Association, The, 2015).

In 2014, the Czech Republic had four cement companies and six cement plants—Ceskomorvsky Cement a.s. (owned by HeidelbergCement with plants at Kraluv Dvur, Mokra, and Radotin), Holcim (Cesko) a.s., Lafarge Cement a.s., and Cement Hranice a.s. Between 2000 and 2014, Czech cement plants became significantly greener. In 2000, 61.7% of the fuel used for cement production came from coal, and none came from biomass. In contrast, in 2014, only 36.6% of cement production was fueled by coal, and 26.8% was fueled by biomass (Czech Cement Association, 2015).

In August 2013, it was announced that CEMEX S.A.B. de C.V. (Cemex) of Mexico and Holcim of Switzerland had agreed to swap their European assets. According to the agreement, Cemex was to acquire all Holcim's assets in the Czech Republic and to divest all its assets in western Germany. In addition, in Spain, Cemex would acquire the Gador cement plant, which had the capacity to produce 850,000 t/yr of cement, and the Yeles cement grinding plant, which had the capacity to process 900,000 t/yr of cement. As a part of this transaction, Cemex was to pay 45 million euros to Holcim. In March 2014, the Office of Protection of Competition of the Czech Republic approved the swap of the assets between the two companies. It was announced that, upon completion of the deal in March 2015, Holcim Cesko would change its name to Cemex Cement. All transactions were expected to be completed during the first quarter of 2015 (GlobalCement.com, 2014a, b; 2015).

Mineral Fuels and Related Materials

Petroleum.—Ceska Rafinerska a.s. (CRC) operated two refineries in the Czech Republic—the Kralupy refinery and the Litvinov refinery, which had annual capacities to process 3.3 Mt/yr and 5.4 Mt/yr of petroleum, respectively. The refineries received crude petroleum using two pipelines—one from Russia and one from the Port of Triest in Italy, which is located on the Adriatic Sea. As of 2014, the refineries produced diesel (53.7%), gasoline (24.6%), bitumen (7.2%), and other refined products. In June, the company signed an agreement with Rosneft of Russia to increase monthly shipments of petroleum. According to the agreement, Rosneft would increase shipments by 50,000 metric tons per month for the entire period of the contract, from April 1, 2014, through June 30, 2016. According to the earlier contract of June 2013, Rosneft was to supply a total of 8.28 Mt of petroleum through the Druzhba pipeline through June 2016. The total value of the new contract was $7 billion (OilCapital.ru, 2014; Unipetrol, a.s. 2015).

At the beginning of 2014, PKN Orlen Group of Poland, through its subsidiary Unipetrol a.s., held 67.5% interest in CRC, and Eni International B.V. held the other 32.5%. In May 2014, Eni announced that it had agreed to sell its shares in CRC to the MOL Group of Hungary. In response, Unipetrol announced that it would exercise its preemption right and would buy the 32.5% stake in CRC for $40.8 million. According to Unipetrol's overall strategy for 2013–2017, which was released in June 2013, the refinery operator indicated that it was planning to further integrate the refining and petrochemical segments of the business in order to ensure the security of the supply of petrochemical feedstock for its operations. The sale was to be finalized by yearend 2014, after which Unipetrol would have full control of the Czech oil refineries (Oil & Gas Journal, 2014).

In July, the Government of the Czech Republic indicated that it would be interested in acquiring one of the Czech refineries. The Government owned oil pipelines in the country and was interested in maintaining the Czech energy infrastructure in good working order; in particular, the Government was concerned that the refineries were operating well under capacity. It appeared that the Government was particularly interested in the Kralupy refinery. At yearend 2014, no deal had been reached between PKN Orlen and the Government (OilNews, 2014).

Uranium.—At the height of uranium production, Czech mines produced as much as 2,500 t/yr of uranium, but production had declined rapidly since 1990. In 2014, the Czech Republic produced only 165 t of uranium. The last underground mine, the Rozna Mine, which is located near Dolni Rozinka, 50 kilometers (km) northwest of Brno, was operated by the state controlled Diamo s.e. During the life of the Rozna Mine, almost 20,000 t of uranium had been extracted. The mine was supposed to close in 2003, but its life was prolonged owing to rising uranium prices. In 2014, the mine was essentially depleted and was likely to close in 2017. Diamo was considering reopening the Brzkov Mine, which is located near Jihlava. The Brzkov Mine was prospected in the 1980s, at which time about 60 t of uranium was extracted. The Brzkov deposit was estimated to contain between 3,000 and 4,000 t of uranium at a depth of about 300 meters. Diamo indicated that it would take 6 to 7 years to commission the Brzkov Mine, and the mine would likely operate for about 16 years (Richter, 2014; World Nuclear News, 2014, 2015).

Outlook

In the near future, the production of industrial minerals is likely to continue to dominate Czech mineral production. Based on the recent opposition to gold mining, metals mining is not expected to be revived in the near future. The opening of new uranium mines also would be difficult owing to environmental concerns. If the prices of their products remain low, steel producers are likely to continue facing financial problems, and they may address them through ownership changes, restructuring, and technical modernization. Synergies between petroleum refining and the petrochemical industry might elevate the relative importance of these industries in the country.

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TABLE 1
CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]	2010	2011	2012	2013	2014
METALS					
Aluminum, metal, secondary	40	50	50 [e]	50 [e]	45 [e]
Iron and steel, metal:					
Pig iron	3,987	4,137	3,936	4,041	4,152
Steel, crude	5,180	5,583	5,072	5,171	5,360
Semimanufactures, hot-rolled products	4,625	4,616	4,276	4,300 [e]	4,400 [e]
Lead, metal, secondary	30	32	30	28	30 [e]
INDUSTRIAL MINERALS					
Cement, hydraulic	3,559	4,053	3,434	3,211	3,691
Clays:					
Bentonite	183	160	221	226	301
Brick clays and related materials	1,836	1,943	1,851	1,589	1,509
Kaolin, raw	3,493	3,606	3,318	3,108	3,281
Other	429	499	484	465	518
Diatomite	32	46	43	49	34
Dolomite	385	369	440	392	449
Feldspar	388	407	445	411	422
Feldspar substitutes, including nepheline syenite	19	22	15	15	17
Gemstones, crude:					
Moldavite-bearing rock	103	117	74	73 [r]	81
Pyrope-bearing rock	23	17	12	16	18
Gypsum and anhydrite, crude	5	11	14	11	11
Lime, hydrated and quicklime	1,062 [r]	1,093 [r]	956 [r]	951 [r]	1,052
Nitrogen, N content of ammonia	121 [r]	107 [r]	116 [r]	153 [r]	175
Sand and gravel:					
Common sand and gravel	19,240	21,424	18,785	17,363 [r]	17,668
Foundry sand	473	395	491	412	603
Glass sand	888	976	849	862	734
Silica minerals, including quartz and quartzite	14	24	17	15	16
Stone:					
Crushed	37,270	36,717	32,535	33,454 [r]	35,972
Dimension	823	648	504	462	549
Limestone and other calcareous stones	9,828	11,244	9,858	9,269 [r]	10,342
Sulfuric acid	195	258	200 [e]	200 [e]	220 [e]
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Bituminous	11,193	10,967	10,796	8,610	8,341
Brown and lignite	43,931	46,848	43,710	40,585	38,348
Total	55,124	57,815	54,506	49,195	46,689
Fuel briquets from brown coal[e]	140	150	140	-- [3]	-- [3]
Coke, from coke ovens	2,548	2,588	2,466 [r]	2,489	2,533
Gas:					
Manufactured, all types[e] million cubic meters	1,500	1,500	1,500	1,500	NA
Natural, marketed do.	201	187	204	207	198
Petroleum:					
Crude[4] thousand 42-gallon barrels	1,176 [r]	1,108 [r]	1,020	1,034 [r]	1,000
Refinery products[5] do.	34,100 [r]	30,900 [r]	30,700 [r]	28,200 [r]	40,200
Uranium:					
Mine output, U content metric tons	259	252	222	232	165
U_3O_8 content do.	305	297	262	274	193
Concentrate production, U content do.	237	216	219	206	146

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto. NA not available. -- Zero.

[1] Table includes data available through January 12, 2016.

[2] In addition to the commodities listed, ferrovanadium, secondary copper, secondary gold recovered from scrap, graphite, precious metals, and zinc metal may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Figures were converted to barrels from production reported in thousand metric tons, as follows: 2010—173; 2011—163; 2012—150; 2013—152; and 2014—147.

[5] Estimated based on throughput reported in million metric tons, as follows: 2010—4.352; 2011—3.942; 2012—3.927; 2013—3.607; and 2014—5.13.

TABLE 2
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, secondary	Alcan Decin Extrusions s.r.o. (Constellium)	Decin, northern Bohemia	NA
Do.	Kovohute Holdings DT—Mníšek Division (majority owned by Demonta Trade SE)	Mnisek pod Brdy	NA
Bentonite	KERAMOST a.s.	Most	NA
Do.	Sedlecky Kaolin a.s.	Bozicany	NA
Cement	Cement Hranice a.s. (Dyckerhoff Aktiengesellschaft, 100%)	Hranice	1,100
Do.	Ceskomoravsky Cement a.s. (Heidelberg Cement AG, 100%)	Mokra	1,400 [e]
Do.	do.	Radotin	800 [e]
Do.	do.	Kraluv Dvur	NA
Do.	Holcim (Cesko) a.s. (Holcim Ltd., 100%)	Prachovice	1,200
Do.	Lafarge Cement a.s. (Lafarge S.A., 70%; STRABAG SE, 30%)	Cizkovice	1,200
Clay	LB Minerals s.r.o.	Horni Briza	NA
Do.	KERAMOST a.s.	Most	NA
Do.	Ceske Lupkove Zavody a.s.	Nove Straseci (refractory clay)	NA
Do.	P-D Refractories CZ a.s.	Velke Opatovice (refractory clay)	NA
Do.	RAKO-LUPKY s.r.o.	Lubna u Rakovnika	NA
Do.	Kaolin Hlubany a.s. (WBB Minerals, 94%)	Podborany	NA
Coal:			
Bituminous	OKD a.s. (New World Resources N.V.)	4 mines near Ostrava and Kravina in eastern Czech Republic	13,000 [e]
Brown	Dul Kohinoor a.s. (Czech Coal Group)	Centrum Mine in Marianske Radcice	350 [e]
Do.	Severní Energeticka a.s.	CSA Mine near Most	5,000 [e]
Do.	Severoceske Doly a.s. (CEZ Group a.s., 100%)	Nastup Tusimice Mine southwest of Chomutov and Bilina Mine in Bilina	25,000 [e]
Do.	Sokolovska Uhelna a.s.	Jiri and Druzba Mines at Sokolov	10,000 [e]
Do.	Vrsanska Uhelna a.s. (Czech Coal Group)	Vrsany Mine just west of Most (contai the Vrsany and the Sverma sites)	10,000 [e]
Lignite	Lignit Hodonin s.r.o.	Hodonin, south of Moravia	500
Coke	ArcelorMittal Ostrava a.s.	Ostrava	1,500
Do.	Ostravo-Karvinské Koksovny a.s. (OKK) (Metallmex s.r.o.)	Jan Sverma coking plant near Ostrava	400
Do.	do.	Svoboda coking plant near Ostrava	650
Do.	Trinecké Železarny a.s. (Moravia Steel a.s., 69%)	Trinec	700
Feldspar	LB Minerals s.r.o.	Horni Briza	NA
Do.	KMK Granit a.s.	Krasno	NA
Do.	Druzstvo DRUMAPO	Nemcicky	NA
Do.	Ceske Sterkopisky Spol s.r.o.	Prague	NA
Do.	AGRO Brno - Turany a.s.	Brno	NA
Feldspar substitutes (including nepheline phonolite and syenite)	KERAMOST a.s.	Most	NA
Ferrovanadium	Nikom a.s. (Evraz Vitkovice Steel a.s.)	Vitkovice-Ostrava	5
Gold, metal, secondary	Kovohute Pribram Nastupickna a.s.	Pribram	NA
Do.	Galmet trade, spol. s r.o.	Dolni Brezany	NA
Graphite	Grafitove Doly Stare Mesto s.r.o.	Stare Mesto	NA
Iron and steel:			
Pig iron	ArcelorMittal Ostrava a.s. (ArcelorMittal, 100%)	Kunice-Ostrava	3,000
Do.	Trinecké Železarny a.s. (Moravia Steel a.s., 69%)	Trinec	2,100
Steel:			
Crude	ArcelorMittal Ostrava a.s. (ArcelorMittal, 100%)	Kunice-Ostrava	3,000
Do.	Vitkovice Steel a.s.	Vitkovice-Ostrava	950
Do.	Pilsen Steel s.r.o. (OAO OMZ)	Plzen	150
Do.	Poldi s.r.o. (Z-Group Steel Holding)	Kladno	120 [e]
Do.	Trinecké Železarny a.s. (Moravia Steel a.s., 69%)	Trinec	2,600

See footnotes at end of table.

TABLE 2—Continued
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel—Continued:			
Steel—Continued:			
Crude (continued)	Vitkovice Heavy Machinery a.s. (Martinley Holdings Ltd., Nabara Holdings Ltd., Vitect Services Ltd., Hayston Investments Ltd., and Dawnaly Investments Ltd.)	Vitkovice-Ostrava	200
Processed products	Zelezarny Hradek a.s. (Z-Group Steel Holding)	Hradek	NA
Do.	Zelezarny Veseli, a.s. (Z-Group Steel Holding)	Veseli nad Moravou	NA
Do.	Zelezarny Chomutov s.p. (Z-Group Steel Holding)	Chomutov	NA
Do.	ZDB Drátovna a.s. (Trinecké Železarny a.s.)	Bohumin	40[e]
Do.	ArcelorMittal Ostrava a.s. (ArcelorMittal, 100%)	Kunice-Ostrava	NA
Do.	Vitkovice Steel a.s.	Vitkovice-Ostrava	NA
Do.	Trinecké Železarny a.s. (Moravia Steel a.s., 69%)	Trinec	NA
Kaolin	KERAMOST a.s.	Most	NA
Do.	Sedlecky Kaolin a.s.	Bozicany	NA
Do.	LB Minerals s.r.o.	Horni Briza	NA
Do.	Kaolin Hlubany a.s.	Podborany	NA
Do.	KSB s.r.o.	Bozicany	NA
Lead, refined, metal, secondary	Kovohute Pribram Nastupickna a.s.	Pribram	30
Natural gas million cubic meters	Gasfield operators in Brno and Ostrava regions, including:	Eastern/southeastern Czech Republic, including:	200[e,1]
	Moravske Naftove doly a.s.	Hodonin	
	Ceska Naftarska Spol s.r.o.	do.	
	Green Gas DPB a.s.	Paskov	
	UNIGEO a.s.	Ostrava-Hrabova	
Petroleum:			
Crude thousand 42-gallon barrels	Oilfield operators around Hodonin, including:	Of which:	2,100[e,1]
	Moravske Naftove doly a.s.	Hodonin	
	Ceska Naftarska Spol s.r.o.	do.	
	UNIGEO a.s.	Ostrava-Hrabova	
Refinery million 42-gallon barrels per year	Ceska Rafinerska a.s. (CRC) (Unipetrol a.s., 100%)	Refineries at Litvinov and Kralupy nad Vltavou	68
Sand, industrial (glass and foundry)	Provodinske pisky a.s.	Provodin	NA
Do.	Sklopisek Strelec a.s.	Mladejov	NA
Do.	LB Minerals s.r.o.	Horni Briza	NA
Do.	Kalcit s.r.o.	Brno	NA
Do.	SEDOS doprava a.s.	Drnovice	NA
Do.	PEDOP s.r.o.	Lipovec	NA
Do.	SETRA s.r.o.	Brno	NA
Uranium, U content metric tons	DIAMO s.e. (Government, 100%)	Rozna Mine at Dolni Rozinka	500

[e] Estimated. Do., do. Ditto. NA Not available.

[1] Annual capacity listed is total for all deposits, mines, and companies that produce the commodity.

THE MINERAL INDUSTRIES OF DENMARK, THE FAROE ISLANDS, AND GREENLAND

By Alberto Alexander Perez

DENMARK

The Kingdom of Denmark, which is a constitutional monarchy, includes Denmark and the self-governing areas of the Faroe Islands and Greenland. The ice-free land-mass area of Greenland is almost 10 times larger than Denmark, and Denmark is 30 times larger than the Faroe Islands. The population density of Denmark is about 131 persons per square kilometer (km^2), which is relatively high compared with other European countries. On January 1, 2015, Denmark's population was 5,659,715, and its population growth rate was 0.38% in 2014. The population growth that Denmark experienced was owing to an annual birth rate of 1.6%, and to a high rate of immigration into the country (Statistics Denmark, 2015, p. 2–4).

Denmark's mineral resources are limited and composed mainly of industrial minerals and mineral fuels; the country's production of these minerals is not significant. Denmark is a member of the European Union (EU) and is located at the junction of the Baltic Sea, the North Sea, and the Skagerrak Strait (U.S. Department of State, 2014).

Trade has always been important for Denmark, but during the past few years, it has become even more relevant, as imports and exports increased as a percentage of the gross domestic product (GDP)—from less than 40% in 1997 to more than 50% in 2014, when imports increased by 3.8% and exports increased by 2.6% compared with those of 2013. Trade in services has increased over time and has almost tripled since 1994; trade in goods doubled during the same period of time, however, and remains the major component of foreign trade. In 2014, Denmark's most important trading partners were Germany, Sweden, and the United Kingdom, which accounted for 14.6%, 10.9%, and 7.1%, respectively, of Denmark's exports and supplied 16.4%, 11.2%, and 6.7%, respectively, of its imports. Denmark's most important trading partners outside of the EU were the United States (9% of exports and 6.5% of imports) and Norway (7.2% of exports)(Statistics Denmark, 2015).

Production

In 2014, Denmark's production of sand and gravel increased by 59.4%. Other commodities for which production increased significantly were bentonite, 17.8%; secondary aluminum, 2.7%; cement, 2.5%; and crushed stone, 2.5%. Commodities for which production decreased significantly were moler, 7.3%, and crude petroleum, 5.7%. Denmark lacked economically exploitable metallic mineral resources, and its mineral production consisted mainly of industrial minerals, crude petroleum, natural gas, and refinery products. Denmark was the world's only commercial producer of moler, which is a natural mixture of diatomite and smectite clay, and is known generically as moclay. The range of uses for this mineral is wide, including filtration systems, insulation bricks, and cat litter (tables 1, 2; Damolin A/S, 2014).

Structure of the Mineral Industry

Private ownership, exploration, development, and production of minerals were allowed under Danish law. The permitting procedures for mineral production were developed and administered at the county level. Denmark's regulations concerning the mineral industry were comparable with those of other EU countries, and Denmark's mineral industry was mostly privately owned. One of the principal exceptions was Nordsøfonden, which was Denmark's state-owned oil and gas company. Since 2005, Nordsøfonden had owned a 20% interest in all new licenses in the oil and gas sector. The company was also a nonoperating partner in the Dansk Undergrunds Consortium (DUC) and held a 20% interest in the DUC's concession area. Table 2 is a list of the country's major mineral industry facilities, their capacities, and their locations (table 2; Nordsøfonden, 2014).

Commodity Review

Industrial Minerals

Cement.—Aalborg Portland A/S (Aalborg) (a subsidiary of Cementir Holdings S.p.A. of Italy) was the main producer of gray and white cement in Denmark. Aalborg operated seven kilns at its plant in Rordal, which had a combined capacity of 2.1 million metric tons per year of gray cement and 850,000 metric tons per year (t/yr) of white cement. The gray cement was sold mainly on the domestic market, whereas the white cement was marketed on the international market. Aalborg also produced ready-mix concrete.

In 2014, Aalborg invested $7.47 million[1] in a facility to increase its use of fuel produced from industrial waste. The company stated that the investment reduced its use of fossil fuels and that, in 2014, 33% of the fuel supplied to furnace 87 was produced from industrial waste. Aalborg sought to replace 45% of the furnace's fuel with industrial waste by 2015. Since 2010, the company had reduced the plant's consumption of electricity and fuel and saved 222 million kilowatthours (Cementir Holdings S.p.A., 2014; Aalborg Portland A/S, 2015).

Salt.—Akzo Nobel A/S's production of salt at Mariager was based on vacuum salt technology. The main material was a raw brine produced by solution mining in multieffect evaporation plants located at Hvornum. The salt produced was suitable for the electrolytic production of caustic lye, chlorine, and sodium chlorate. Akzo Nobel originally had a 50-year license to extract salt, which was scheduled to expire in 2013, and in 2009, the company negotiated a new 30-year license (Akzo Nobel A/S, 2014).

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[1] Where necessary, values have been converted from Danish kroners (DKK) to U.S. dollars (US$) at an annual average rate of DKK5.619=US$1.00 for 2014. All values are nominal, at current prices, unless otherwise stated.

Mineral Fuels

Petroleum and Natural Gas.—On October 20, the seventh licensing round for submitting applications for new oil and gas exploration ended. The Danish Energy Agency received 25 applications from 15 oil companies; several had not previously held licenses in Denmark. The 15 companies were A.P. Møller-Mærsk A/S, Ardent Oil Ltd., Dana Petroleum Denmark B.V., Danoil Exploration A/S, DONG E&P A/S, Dyas B.V., Edison International S.p.A., Hansa Hydrocarbons Ltd., Hess Denmark ApS, Mærsk Olie & Gas A/S, Noreco Oil Denmark A/S, PA Resources UK Ltd., RWE Dea AG, Shell Olie & Gasudvinding B.V. of the Netherlands, and Wintershall Noordzee B.V. Denmark's state-owned oil and gas company, Nordsøfonden, had a 20% interest in all new licenses. The areas that were offered for licensing included unlicensed areas in the Central Graben section of the North Sea, where the majority of Denmark's gas and oil fields have been discovered, and areas further to the east, where oil discoveries were made in the previous licensing round. The Danish Energy Agency intended to continue holding licensing rounds yearly and expected to initiate the next licensing round in mid-2015 (Danish Energy Agency, 2014a, b).

Outlook

Denmark will likely continue to issue licenses for future natural gas and petroleum exploration, as Danish crude petroleum and gas production continue to decline. The development of mineral deposits in Greenland will affect how the Government of Denmark subsidizes the autonomous region, and the benefits that are gained from such development remain unclear.

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FAROE ISLANDS

The Faroe Islands, which is a self-governing overseas administrative division of Denmark, had no significant identified mineral resources, although a small amount of crushed stone was thought to be produced for domestic consumption. The Faroese economy depended mainly on fishing and salmon farming and was aided by an annual subsidy from Denmark of about 3% of the Faroe Island's GDP. The main involvement of the Faroe Islands in the international mineral industry was as a market for imported materials, principally cement, fertilizer materials, and fuels.

Commodity Review

Mineral Fuels

Petroleum.—In June 2014, Statoil ASA (Statoil) of Norway reported that the drilling of the Brugdan II reentry well in its license 006, which was located 130 kilometers (km) offshore of the Faroe Islands, had concluded. The company planned to plug and abandon the well, as it was determined to be dry. The well had been drilled using the West Hercules semisubmersible rig in a water depth of 450 meters. This was the second exploration well that Statoil had drilled in the 579-km^2 license 006 area that had proved to be dry.

To establish a leading position in frontier areas, Statoil operated four licenses in the Faroe Islands and as part of the company's exploration strategy of early field exploration. Statoil held a 35% interest in license 006, and Exxon Mobil Corp. of the United States held a 49% interest; OMV Aktiengesellschaft of Austria, 15%; and Atlantic Petroleum P/F, 1%. Statoil planned to move the West Hercules semisubmersible rig to its license 008 in the Faroe Islands where the company planned to drill the Sula/Stelkur well (Statoil ASA, 2014).

Outlook

The exploration for crude oil will continue to be the most important activity in the mineral resource industry in the Faroe Islands for the foreseeable future. Several companies will likely continue to be engaged in geophysical exploration and exploration well drilling. Future discoveries in the Faroe Islands could make the eventual production of petroleum possible.

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GREENLAND

Greenland (officially known as Kalaallit Nunaat) is a self-governing overseas administrative division of the Kingdom of Denmark. Greenland's government is based in the capital city of Nuuk. It has an ice-free area of 410,449 km^2 and a coastline of 44,087 km^2, making it the largest island in the world.

Greenland receives an annual grant and subsidies from Denmark of about $648 million, and it uses the Danish kroner as its official currency. Greenland's population in 2014 was 55,984, with 16,992 people living in Nuuk. The country's population rate of growth was -0.5%. Greenland's economy depended mostly on fisheries and, in 2014, its most important exports were provisions and livestock. Only 2% of exports were derived from mining, mainly gold and olivine (Government of Greenland, 2014; Statistics Greenland, 2015, p. 3–7).

In 2014, a total of 28 new mineral licenses were granted, 8 were renewed, and 8 were terminated. Of the new licenses, 15 were exploration licenses (Bureau of Minerals and Petroleum, 2013, p. 5–6; Bureau of Minerals and Petroleum, 2015, p. 9).

Greenland had six rare-earth projects, of which the most important were two that were located in the Ilimaussaq complex—the Kvanefjeld project and the Kringlerne project. The others were the Milneland, the Motzfeldt, the Sarfartoc, and the Tiqiusaaq projects. As of yearend 2014, only feasibility studies had been produced, and mining activity remained insignificant (Goldletter International, 2014, p. 10–12; Greenland Minerals and Energy Ltd., 2014; Statistics Greenland, 2015, p. 16).

Commodity Review

Metals

Iron and Steel.—At a meeting on December 21, 2014, the government approved the indirect transfer of London Mining Greenland A/S to General Nice Development Ltd. of China. The government of Greenland reported that the company planned to develop an iron ore mine at Isukasia in western Greenland for which London Mining Greenland held the license. General Nice Development was a Hong Kong-based company with its main operational center at Tianjin City in mainland China. The government clarified that an indirect transfer of the license meant that the structure and name of London Mining Greenland A/S would remain the same, but that General Nice Development would be the owner. The government reported that London Mining Greenland would keep headquarters in Nuuk and continue to employ the current staff. The mine was projected to take about 3.5 years to construct and would be operational for an estimated 15 years. The project would include an approximately 105-km road, a harbor, a residential area, a workshop, fuel and explosives depots, and related infrastructure, which could include an airstrip (Government of Greenland, 2015).

Industrial Minerals

Gemstones.—The Ministry of Mineral Resources of Greenland reported that construction of infrastructure was underway for the development and exploitation of the True North Gems Inc. (TNG) Aappaluttoq ruby and pink sapphire deposit in Fiskeaesset in southwestern Greenland, which is located approximately 160 km southwest of Nuuk. The Ministry stated that gem- and near-gem-quality rubies and pink sapphires occur along the metasomatic contact between the Fiskeaesset anorthosite and amphibolite, which extends for more than 200 km. More than 65 kilograms (kg) of gemstones and more than 129 kg of near-gem-quality rubies and pink sapphires had been recovered from 48 metric tons of processed material. TNG had been exploring the area since 2004 and was granted an exploitation license for the Aappaluttoq project in March 2014. The company updated its prefeasibility study, which stated that the resources of the deposit were 77,160 t at an inferred grade of 1,417 carats per metric ton and a (lower) cutoff size of 1.7 millimeters; the expected mine life was 9 years. According to the government of Greenland, production from the deposit would introduce significant quantities of Greenland's colored gemstones to the international market (Bureau of Minerals and Petroleum, 2015, p. 1–2).

Rare Earths.—Greenland issued several exploration licenses for rare-earth elements (REEs) since it changed its policy on exploitation of radioactive minerals in October 2013. The largest identified REE deposits were the Kvanefjeld and the Kringlerne deposits, which were owned by Greenland Minerals and Energy (GMEL) of Australia and Tanbreez Mining Greenland ALS (Tanbreez), respectively. The Kvanefjeld project is located in the northern Ilimaussaq complex on the southwestern tip of Greenland. The Kringlerne deposit is located in southern Greenland between the cities of Narsaq and Qaqortoq, and is also known simply as the Tanbreez project. GMEL continued its investigation of the Kvanefjeld deposit and reported it to be a significant REE deposit with substantial uranium and zinc resources. The company reported that the deposit was second in size only to the Bayan Obo REE deposit in China. The main focus of GMEL's investigation was to develop an effective method of beneficiating the multiple-element ores (Goldletter International, 2014, p. 10; Greenland Minerals and Energy Ltd., 2014).

In September 2013, Tanbreez applied for an exploration license for the Killavaat Alannguat multiple-element deposit in southern Greenland and, as of December 2014, negotiations were ongoing. The deposit was calculated to contain more than 3 billion metric tons of eudialyte-bearing resources. The company planned to produce eudialyte concentrate and feldspar from an estimated 500,000 t/yr of ore. From the eudialyte, the company planned to extract tantalum, niobium, REEs, and zirconium. This project would include the construction of an open pit mine, a processing plant for magnetic separation, a port and helipad, a camp, a tailings deposit, and connecting infrastructure for the complex. The company expected to employ up to 135 people during construction and about 90 during production. The public hearing process began in the fall of 2013 and, as of yearend 2014, negotiations with the government of Greenland were ongoing (Bureau of Minerals and Petroleum, 2013, p. 2; 2015, p. 3).

Outlook

Since Greenland changed its legislation to permit the exploitation of radioactive minerals, several companies have begun exploration. The conditions of extraction and the size of the investment necessary for this type of enterprise, however, mean that only well-developed and well-funded projects are likely to be realized. More areas for exploration in Greenland are expected to open up if the ice sheet recedes, especially for crude oil and gas in the Arctic Sea. The country's political autonomy and the likelihood that the government of Greenland will continue to see the new sources of revenue as instrumental in achieving economic autonomy from Denmark are reasons to expect the continued development of the mineral industry in Greenland for the foreseeable future.

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TABLE 1

DENMARK: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
Aluminum, metal, secondary		29,200 [r]	31,300 [r]	26,700 [r]	25,700 [r]	26,400
Cement, gray and white[3]	thousand metric tons	1,540	1,820	1,820	1,830	1,876
Chalk, calcium carbonate	thousand cubic meters	2,700	2,600	2,600	2,571 [r]	2,610
Clays:[3]						
Bentonite		23,832	38,300	30,330	56,355	66,388
Moler, extracted	thousand cubic meters	199 [r]	201 [r]	177 [r]	205 [r]	190 [r]
Gas, natural, dry	million cubic meters	8,211 [r]	7,079 [r]	5,804 [r]	4,842 [r]	4,800 [e]
Gold[4]	kilograms	--	103	307	100	--
Petroleum:						
Crude	thousand 42-gallon barrels	89,425 [r]	80,665 [r]	73,730 [r]	63,875 [r]	60,225
Refinery products:						
Liquefied petroleum gas	do.	1,752	1,533	1,862	1,278 [r]	1,200 [e]
Gasoline	do.	15,330	15,768	17,046	18,980 [r]	19,000 [e]
Jet fuel	do.	3,416	2,154	1,752	1,168 [r]	1,200 [e]
Distillate fuel oil	do.	22,703	21,280	25,331	31,025 [r]	31,000 [e]
Residual fuel oil	do.	7,665	7,373	8,432	9,855 [r]	9,800 [e]
Total	do.	50,866	48,108	54,423	62,306 [r]	62,200
Salt, all forms		601,046	600,000	600,000	600,000	600,000
Sand and gravel	thousand metric tons	17,901	19,966	18,981	17,762	28,306
Stone, crushed	do.	640	542	500	512	525
Sulfur, recovered		3,246	3,045	3,400	3,599	3,600 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through July 29, 2015.

[2] In addition to the commodities listed, kaolin, lime, naphtha, and peat were thought to be produced, but available information was inadequate to make reliable estimates of output.

[3] Volume based on reported sales.

[4] Reported figure.

TABLE 2
DENMARK AND GREENLAND: STRUCTURE OF THE MINERAL INDUSTRIES IN 2014

(Thousand metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
DENMARK				
Cement:		Aalborg Portland A/S (Cementir Holding S.p.A.)		2,100
Gray		do.	Plant at Rordal	2,700
White		do.	do.	850
Chalk (calcium carbonate)	thousand cubic meters	Faxe Kalkbrud A/S (Lhuist group S.A.)	Quarries at Stevns and Sigerslev	280
Diatomite (moler)	do.	Damolin A/S	Quarries on Mors and Fur Islands	250
Lime		A/S Faxe Kalkbrud (Lhuist group S.A.)	Plant at Stubberup, near Fakse, on Zealand Island	200
Natural gas	million cubic meters	Maersk Olie og Gas A/S	Roar and Tyra gasfields, Danish North Sea	5,000
Petroleum:				
Crude	barrels per day	Dansk Undergrunds Consortium (DUC)[1] (A.P. Møller-Mærsk, 31.2%; Chevron Corp., 12.0%; Nordsøfonden, 20.0%; Royal Dutch Shell plc.36.8%	16 fields in Danish North Sea	173,000
Do.	do.	DONG Energy AS	5 fields in Danish North Sea[2]	NA
Do.	do.	Hess Corp.[3]	1 field in the Danish North Sea	NA
Refined	do.	Statoil A/S	Kalundborg	110,400
Do.	do.	Dansk Shell A/S (Royal Dutch Shell plc. 100%)	Fredericia	63,000
Salt		Akzo Nobel A/S	Mine (brine) at Hvornum, plant at Mariager	1,000
Steel, semimanufactures		NLMK DanSteel A/S (NLMK International BV, 100%)	Plant at Frederiksvaerk	250
GREENLAND				
Gold	kilograms	Angel Mining plc[4]	Nalunaq Mine at Nanortalik	1,100

Do., do. Ditto. NA Not available.

[1] Mærsk Olie og Gas A/S was the operator for all Dansk Undergrunds Consortium activities.

[2] A sixth field, the Herje field, was expected to begin producing oil and gas in 2016.

[3] HESS Corp. operated and owned 65.1% of the South Arne field; DONG Energy A/S owned 36.8%, and Danoil A/S owned 1.7%.

[4] Mine was placed under administration and operations were suspended in 2013.

THE MINERAL INDUSTRY OF ESTONIA

By Karine M. Renaud

Estonia has such mineral resources as bitumen, clays (including ball clay and kaolin), dimension stone, iron ore, mineral sands (including ilmenite, rutile, and zircon), natural gas, ochre, oil shale, peat, polymetallic ores (lead and zinc), rare earths, sand and gravel, sandstone containing phosphorite, and uranium. In 2014, Estonia produced industrial minerals, such as dolomite, gravel, lime, limestone, pebbles, shingle and flint, crushed stone, and its mineral processing industry produced cement, lead (secondary), and rare earths. Oil shale and peat were Estonia's two main mineral fuel resources. Powerplants used 80% of extracted oil shale for the production of shale oil used in the generation of electrical and thermal energy. In 2014, the country was the eighth-ranked peat producer in the world (table 1; Raukas and Teedumäe, 1997; Ministry of the Environment, 2014; PricewaterhouseCoopers LLP, 2014, p. 7; Statistics Estonia, 2015, p. 304; Apodaca, 2016).

Minerals in the National Economy

In 2014, Estonia's real gross domestic product (GDP) increased by 2.1% compared with 0.8% in 2013 owing to increases in manufacturing and foreign trade; the nominal GDP was $26.49 billion. The manufacturing sector, in terms of the value added, accounted for 3% of the total GDP. The mining and quarrying sector, in terms of the value added, accounted for as little as 0.4% of the total GDP owing to a decrease in infrastructure building and a shortage of building materials. Industrial production increased by 2% owing to increases in exports, in domestic sales of manufacturing products, and in production of metal products and refined petroleum products; production of chemicals, however, decreased. In 2014, mining and quarrying production increased by 11%, of which 9% was an increase in the mining and agglomeration of oil shale and 33% was an increase in peat production. The construction sector, in terms of the value added, decreased by 4.1% and accounted for as little as 4.1% of the total GDP (Statistics Estonia, 2015, p. 28, 31–32, 42, 189, 193, 232, 304; World Bank, The, 2016).

Government Policies and Programs

In 2014, The Ministry of the Environment drafted a National Development Plan for the Utilization of Oil Shale (2016–30). The objectives of the plan included limiting the oil shale production capacity to 20 million metric tons per year (Mt/yr) and limiting development of the new mines to one or two during the period 2016–30. These limitations were also included in the amendments to the country's Earth's Crust Act. Estonia was estimated to have 4.75 billion metric tons (Gt) of oil shale, of which the active stock was estimated to be 1.34 Gt. The active stock was expected to be enough to meet domestic demand for approximately 48 years. The plan also proposed the effective and sustainable use of oil shale (to reduce environmental effects), and consideration of the country's economic, security, and social goals when producing oil shale. The cost of implementing the plan was estimated to be 20 million euros[1] (EUR) ($25.5 million). The plan was expected to be reviewed at 5-year intervals to take into account changes in technologies, market conditions, environmental requirements, and environmental effects (Oil Shale Competence Centre, 2014, p. 10; Ministry of Foreign Affairs, 2014a; Natural Gas Europe, 2015; United Nations, 2015).

In 2014, the Government approved a decree to increase mining fees annually by 3% to 6% based on the reserves. A fee of 3% per year was expected to be applied to oil shale mining, and a fee of 6% was expected to be applied to the production of ceramsite clay, decomposed peat, low-grade dolomite, and sand used as fill. The increase in fees was expected to be implemented before 2020 (Baltic Course, The, 2014).

Production

Estonia's production of lime decreased by 80%; peat, by 10%; and crushed limestone and crushed stone used for concrete aggregates, for roadstone, and for other construction uses, by 7% each. Production of flint, gravel, pebbles, and shingle together increased by 29%; fuel oil, by 22%; dolomite, by an estimated 20%; and silica sand, by 15%. Data on mineral production are in table 1.

Structure of the Mineral Industry

In 2014, a total of 164 mining and quarrying companies were active in Estonia, of which 156 were foreign companies, 7 were sole proprietors (domestic private companies), and 1 was a Government-owned enterprise. A total of 8,337 manufacturing companies were operating in the country, of which 1,096 were sole proprietorships, 7,239 were foreign companies or their subsidiaries, and 2 were nonprofit associations. The manufacturing sector employed 114,000 workers in 2014 compared with 116,400 in 2013, and the mining and quarrying sector employed 4,200 workers in 2014 compared with 4,800 in 2013 (Statistics Estonia, 2014, p. 165, 233).

In 2014, the Government of Estonia and the Government of Finland agreed to build two liquefied natural gas (LNG) terminals that would be connected by a pipeline; the project was named "Balticonnector." The project would include the construction of a large-scale LNG terminal in Finland and small-scale LNG terminal in Estonia, and the LNG would be distributed from the terminal in Finland to consumers. The "Balticonnector" project was expected to be completed by 2019 and was expected to get financial support from the European Union (EU). The total cost of the project was estimated to be EUR500 million ($638 million) (Ministry of Foreign Affairs, 2014b).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783=US$1.00 for 2013.

Mineral Trade

In 2014, Estonia's total exports decreased by 2% to EUR12.1 billion ($15.4 billion) from EUR12.3 billion ($15.7 billion) in 2013, and imports decreased by 1% to EUR13.7 billion ($17.5 billion) in 2014 from EUR13.9 billion ($17.8 billion) in 2013. Exports of raw materials and chemical products decreased by 14%, and precious stones and metals, by 43%. Exports of mineral fuels and mineral oils and products of their distillation decreased by 4.3% (and accounted for 11% of total exports); salt, sulfur, lime and cement, by 5%; iron and steel, by 8% (2% of total exports); iron and steel articles, by 6% (3% of total exports); copper and copper products, by 11%; nickel and nickel products, by 54%; and aluminum and aluminum products and lead and lead products, by 1% each. The country's major export partners were Sweden, which accounted for about 17% of total exports; Finland, 15%; Latvia, 11%; Russia, 10%; and Lithuania and Germany, 5% each (Statistics Estonia, 2015, p. 245, 250, 252–253, 260).

Mineral fuels, including natural gas, liquid fuels, coal, and coke, were imported by Estonia for domestic use and were among the leading imported commodities, accounting for 13% of the total imports. Imports of nickel and nickel products decreased by 65%; copper and copper products decreased by 3%; aluminum and aluminum products decreased by 5%; and iron and steel and iron and steel products decreased by 2% each and accounted for 3% each of total imports. The country's major import partners were Finland, which accounted for about 15% of total imports; Germany, 12%; Sweden and Latvia, 9% each; Lithuania and Poland, 8% each; and Russia and the Netherlands, 6% each. About 78% of Estonia's total trade was with EU member countries. The value of exports to EU countries accounted for 72% of Estonia's total exports; the value of imports from EU countries accounted for 83% of Estonia's total imports (Statistics Estonia, 2015, p. 245, 255, 258, 261–262, 325).

Estonia's exports to the United States were valued at $562.6 million in 2014 compared with $422.7 million in 2013. In 2014, nonferrous metals accounted for $14.5 million; coal and related fuels, $3.7 million; fertilizers, $3.2 million; iron and steel, $2.0 million; iron and steel products, $751,000; petroleum products, $232,000; and stone, sand, and cement, $11,000. In 2014, imports from the United States were valued at $308.5 million compared with about $293.2 million in 2013; the imports included $1.1 million in precious metals, $407,000 in iron and steel products, $369,000 in nonferrous metals, $115,000 in nonmetallic minerals, $122,000 in petroleum products, $22,000 in aluminum and alumina, and $20,000 in copper (U.S. Census Bureau, 2015a, b).

Commodity Review

Industrial Minerals

Cement and Limestone.—AS Kunda Nordic Tsement (Kunda Nordic) was a leading cement and crushed-limestone producer and employer in Estonia; the company operated the country's sole cement plant, which was located at Kunda and had production capacities of 650,000 metric tons per year (t/yr) of clinker and 750,000 t/yr of cement. Kunda Nordic was a subsidiary of HeidelbergCement Sweden AB of Sweden (75%) and CRH Europe Holding BV of the Netherlands (25%). In 2014, Kunda Nordic produced 720,480 metric tons (t) of clinker, 447,350 t of portland cement, and 335,200 t of crushed limestone (AS Kunda Nordic Tsement, 2014; 2015, p. 4; 2016; CemNet.com, 2014; Eesti Ehitusmaterjalide Tootjate Liit, 2014; International Cement Review, 2015, p. 127).

Lime.—In 2013, Viru Keemia Grupp Energia OÜ contracted Viru RMT to manage the construction of a lime plant at an estimated cost $5.75 million. The plant was expected to produce low-quality lime for trapping sulfur dioxide, and the raw material was expected to be from waste rock at the Ojamaa Mine. The lime furnace was installed with a production capacity of 26,300 t/yr of lime. The lime plant was commissioned in 2014 (Viru Keemia Grupp AS, 2014b; Viru RMT, 2014).

Nitrogen (Ammonia).—Nitrofert JSC (Nitrofert) was Estonia's only ammonia producer; it had a production capacity of 200,000 t/yr of urea and 180,000 t/yr of ammonia. In 2014, Nitrofert became a wholly owned subsidiary of GDF Group DF of Ukraine and employed 480 workers. The Nitrofert fertilizer plant was located in Ida-Viru County in the industrial region of Kohtla-Jarve. Nitrofert imported natural gas from Russia to provide energy for use in the manufacturing of ammonia and to reduce its domestic fuel and energy costs. In 2012, Nitrofert resumed its operations, but in 2013, the operation stopped again. In 2013, through NF Trading of Finland, Nitrofert exported 15,000 t of ammonia to the United States at a price of about $600 per metric ton. In 2014, when Nitrofert became a part of GDF Group DF, production had been expected to start up again in the spring of that year; however, production remained halted owing to the low global market price and the political situation in Ukraine (ICIS, 2012; Egenhofer and others, 2014; GDF Group DF, 2014; Voropajeva, 2014).

Rare Earths.—Molycorp Silmet AS was the only producer of rare earths in Estonia and employed about 550 people. Molycorp Minerals LLC of the United States owned 80% of Silmet Group's manufacturing facilities in Sillamäe, and Treibacher Industrie AG of Switzerland and Silmet Group each owned 10%. Molycorp Silmet exported its products to Asia, Europe, Central Eurasia, North America, and South America. In 2014, Molycorp Silmet stopped production of rare-earth compounds for 3 months owing to renovation of the factory (Molycorp Inc., 2011; 2013, p. 5–6, 9; 2014a; 2014b, p. 15, 46; Ärileht.ee, 2014; Oja, 2014).

Mineral Fuels and Other Sources of Energy

Oil Shale.—The two main oil shale deposits in Estonia were Narva and Tapa, which are located in the Baltic Shale basin in northeastern Estonia and extended eastward into Russia. Estonia's oil shale deposit covers approximately 3,000 square kilometers. According to Eesti Energia, the total estimated resources of oil shale were 4.8 Gt, of which 3.2 Gt was usable. The extractable oil shale reserves were expected to last for 60 to 70 years at current rates of extraction. In 2014, the consumption of shale oil by powerplants decreased by 5% owing to the implementation of renewable sources of energy, including wind energy. The shale oil was exported to Belgium (33%), the Netherlands (33%), and Sweden (8%). Since 2005, oil shale mining in Estonia was moving toward underground mining in order to reduce environmental damage. In 2013 (the latest year for which detailed information was available), Estonia's oil shale mines were 39% open pit mines and 61% underground; by 2030, Estonia planned to have 5% of its oil shale mines be open pit mines, and 95%, underground mines (Bauert and Kattai, 1997; Aaloe and others, 2007; p. 11; International Energy Agency, 2014; Oil Shale Competence Center, 2014, p. 18, 29; Statistics Estonia, 2014, p. 322).

Government-owned energy company Eesti Energia AS Group was one of the leading energy companies as well as one of the leading employers in Estonia with 6,700 employees. In 2014, the company operated two oil-processing plants—Enefit140 and Enefit280—with a total combined capacity of 2.7 Mt/yr of shale oil. In 2014, Enefit280 was tested for production at full capacity, which was 2 million barrels of shale oil (Eesti Energia AS Group, 2014, p. 4, 6, 11; 2015; Tooman, 2014).

Viru Keemia Grupp AS (VKG) produced 57% of Estonia's total shale oil in 2014. VKG Kaevandused was a subsidiary of VKG and was involved in the mining of oil shale. In 2014, VKG produced 433,000 t of shale oil, and launched the Petroter II shale-oil-processing plant with a production capacity of 3,000 t/yr of shale oil. VKG invested $84.9 million in plant technology at Petroter III in 2014; the plant was expected to be commissioned in 2015 (Viru Keemia Grupp AS, 2014b; 2015, p. 7, 14).

In 2014, VKG closed two Kiviter-type plants and laid off 76 employees owing to a disagreement between VKG and the Ministry of the Environment about the increase in the amount of oil shale to be mined from the Ojamaa Mine. Owing to the dispute, VKG bought the oil shale from Eesti Energia at two times the regular price in 2014 (Viru Keemia Grupp AS, 2014a, b).

Peat.—In 2014, Estonia's peat production decreased by 10%. Estonia's electricity producers had to buy carbon dioxide (CO_2) allowances when using peat as a fuel. AS Tootsi Turvas, which was headquartered in Pärnu, was the leading peat producer. The company, which was wholly owned by Vapu OY Group of Finland, produced milled peat at Ellamaa, Lavassaare, Peningi, Puhatu, and Ulila. In 2014, AS Tootsi Turvas planned to expand its peat production by developing a peat deposit at Halinga in Pärnu County with total estimated resources of 131,000 t. The company's production capacity was estimated to be 10,000 t/yr of peat. The company had to apply for an 18-year mining license with Pärnu County in Halinga Parish (AS Tootsi Turvas, 2014; Organisation for Economic Co-operation and Development, 2014; Pärnu Postimes, 2014).

Outlook

Estonia's mineral industry is expected to continue to focus on reducing CO_2 emissions by improving technology to achieve greater efficiency throughout the oil shale cycle (from mining to consumption). The efficiencies were planned to be achieved by implementing the National Development Plan for the Utilization of Oil Shale 2016–2030, which limits oil shale production to 20 Mt/yr, and by shifting to renewable energy sources. Production of rare earths is likely to continue to increase to meet global demand.

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TABLE 1
ESTONIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Lead, metal, secondary		7,199	7,840	8,046	7,100	8,588 e
INDUSTRIAL MINERALS						
Cement:						
Clinker		536,691 r	719,002 r	714,569 r	691,443 r	720,480
Portland		375,000	451,000	481,500	456,000 r	447,350
Clays and kilts used in construction		85,000	120,000	98,600	99,000	99,500 e
Dolomite	cubic meters	112	35	25	25	30 e
Gravel, pebbles, shingle and flint	do.	1,252,000	1,251,680	947,000 r	1,207,000 r	1,556,000
Lime		20,217 r	27,862 r	26,000 r	31,391 r	6,431
Limestone		768,472	1,026,350	1,017,415	1,013,176	1,031,133
Limestone, crushed		595,000	525,000	679,600	360,784	335,200
Nitrogen, N content of ammonia	thousand metric tons	-- r	-- r	14 r	99 r	--
Rare-earth compounds		-- r	494 r	-- r	300 r	700 e
Sand silica (industrial)		36,000	14,000	21,000	20,000	23,000
Stone, crushed, used for concrete aggregates, for roadstone, and for other construction use		5,752,600	6,196,300	6,200,000	6,463,000 r	6,000,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, electrode		22,400	24,400	26,300	22,000 r	22,000
Fuel oil		524,300	559,900 r	598,900 r	629,600 r	770,000
Oil shale	thousand metric tons	17,900 r	18,700 r	18,800 r	20,500 r	20,340
Peat, all uses		965,000	926,700	670,800 r	1,061,000 r	950,000
Of which:						
Fuel		360,800	322,600	166,000 r	260,200 r	235,500
Peat briquet		83,600	74,800	52,100 r	56,000 r	35,000

e Estimated; estimated data are rounded to no more than three significant digits. r Revised. do. Ditto. -- Zero.

[1] Table includes data available through October 24, 2015.

[2] In addition to the commodities listed, Estonia produced sulfur, but available information was inadequate to make reliable estimates of output.

TABLE 2
ESTONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facility	Annual capacity
Ammonia	Nitrofert JSC (GDF Group DF, 100%)	Plant at Kohla-Jarve, Ida-Viru County	200 urea; 180 ammonia.
Clinker and cement	AS Kunda Nordic Tsement (HeidelbergCement Sweden AB, 75%, and CRH Europe Holding BV, 25%)	Kunda plant	1,400 clinker and cement.
Dolomite	Nordkalk AS (Rettig Group, 100%)	Kurevere dolostone quarry	NA.
Lead, secondary	Ecometal AS	Sillamäe	20.
Lime	Nordkalk AS (Rettig Group, 100%)	Rakke lime plant	NA.
Do.	VKG Energia OÜ (Viru Keemia Grupp AS, 100%)	Lime plant	24.
Limestone	do.	Vasalemma limestone quarry	NA.
Do.	AS Kunda Nordic Tsement (HeidelbergCement Sweden AB, 75%, and CRH Europe Holding BV, 25%)	Aru-Lõuna quarry	NA.
Limestone, aggregates	do.	Jaama 2, Kunda	NA.
Oil shale metric tons	Eesti Energia AS Group (Government, 100%)	Eesti Energia Õlitööstus	4,200.
Do. do.	VKG Oil AS (Viru Keemia Grupp AS, 100%)	Plant in Kohtla-Jarve	2,800.
Do. do.	Kiviõli Keemiatööstuse OÜ	Kiviõli oil shale plant	45 shale oil.
Do.	AS Kunda Nordic Tsement (HeidelbergCement Sweden AB 75%, and CRH Europe Holding BV, 25%)	NA	NA.
Peat	AS Tootsi Turvas (Vapo OY Group, 100%)	Ellamaa, Lavassaare, Peningi, Puhatu, and Ulila	NA.
Rare earths	Molycorp Silmet AS (MolycorpMinerals LLC, 80%; Treibacher Industrie AG, 10%; Silmet Group, 10%)	Factories in Sillamäe	700.
Shale oil 42-gallon barrels	Eesti Energia AS Group (Government, 100%)	Enefit140 and Enefit 280	2,700.

Do. do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF FINLAND

By Alberto Alexander Perez

In 2014, Finland had a highly industrialized open economy with a gross domestic product (GDP) of about $271.6 billion, which was a decrease of about 0.4% compared with that of the previous year. Finland's mining industry was composed of the extraction and processing of metallic minerals, the extraction and processing of industrial minerals, and the production of steel. In 2014, Finland remained the leading peat producer in the world, with an estimated 24% of world production, and the country was the leading talc producer in Europe and the seventh-ranked talc producer in the world, with 5.3% of world production (Apodaca, 2016; Flanagan, 2016; U.S. Central Intelligence Agency, 2015).

The leading contributor to Finland's GDP in 2014 was its services sector; industry accounted for only 26.5% of the country's GDP. The principal products that Finland's industrial sector produced in 2014 were electronics, machinery and scientific instruments, metals and metal products, ships, and wood pulp and paper products. Finland was a member of the European Union (EU). Its main export partners in 2014 were Germany (which received 12.2% of Finland's exports, in terms of value), Sweden (11.2%), Russia (8.1%), the United States (6.7%), the Netherlands (6.2%), the United Kingdom (5.5%), and China (4.5%). Its main import partners were Sweden (which supplied 15.8% of Finland's imports, in terms of value), Germany (15.3%), Russia (14.8%), the Netherlands (8.7%), and Denmark (4.2%) (U.S. Central Intelligence Agency, 2015).

Minerals in the National Economy

According to information published by the Ministry of Employment and the Economy in 2013, Finland had 46 mines and quarries. All mines and quarries in Finland are regulated by the Finnish Mining Act. The principal facilities for the processing of copper and nickel were located at Harjavalta, those for the processing of chromium were located at Kemi, and those for the processing of zinc were located at Kokkola. Finland's deposits of chromite, cobalt, copper, iron, lead, nickel, and zinc were the foundation for the country's metal industry (Invest in Finland, 2015; Ministry of Employment and the Economy, 2015b).

Government Policies and Programs

The Government of Finland regulates its mineral industry through two legislative acts—the Finnish Mining Act, which regulates the mining of metallic and industrial minerals in Finland, including soapstone and marble, and the Land Extraction Act, which regulates only the extraction of gravel and sand and the quarrying of natural stone. The objective of the Finnish Mining Act (621/2011) is to enable exploration and mining activities and to regulate them so that they are carried out in a socially, economically and ecologically sustainable way. The Act ensures that in the development and exploration of any mining projects, environmental, civil rights, and landowner concerns are included in the decisionmaking process. The Act also takes other Finnish law into account in its application, in particular Finland's Constitution and legislation concerning the Sami regions in northern Finland. Mining operators are subject to a number of permits. The Mining Act, which became effective on July 1, 2011, provides the right to mine a deposit based on a mining permit, and the review of permits is more comprehensive than under the previous Mining Act. The mining operator's termination and after-care obligations are also more extensive, and the mining operator is required to provide a security deposit for the purpose of fulfilling after-care obligations. The Finnish Safety and Chemicals Agency (Tukes) is the organization that grants and supervises the permits that are required by the Mining Act. The Finnish legislation also provides environmental protection guidelines and requires several types of environmental permits to conduct mining operations (Ministry of Employment and the Economy, 2011, 2015a, b).

Production

Finland produced mostly base metals, gold, and platinum-group metals, as well as industrial minerals. The production of mineral commodities continued to be significant in terms of tonnage and contribution to the country's economy. In 2014, production of silver metal increased by 41%; selenium metal, by 29%; pig iron, by 21%; refined copper, by 17%; refined cobalt, by 16%; platinum, by 12%; copper content of mined ore, by 10.3%; and chromite, by 5.4%. Gold mine production decreased by 6%, and that of zinc metal production decreased by 3%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Finnish mineral industry consists of the following two types of companies: (a) small quarry and sand and gravel pit operators, and (b) a group of large companies that operate international metal and industrial mineral facilities and mines in Finland and abroad (United Nations, 2015, p. 1). Outokumpu Oyj (Outokumpu) and Rautararuukki Oyj (Ruukki) were the two leading companies in Finland in the metals manufacturing industry; they specialized in manufacturing steel and stainless steel. Outokumpu also operated the Kemi chromite mine in Lapland, and in addition to steel, also produced cadmium and ferroalloys. Outokumpu was no longer reporting mercury production in Finland, although some production as byproduct was likely. Outokumpu also had operations in Germany, Mexico, Sweden, the United Kingdom, and the United States.

Mondo Minerals Oy (Mondo) of the Netherlands which was a subsidiary of Advent International Corp. of the United States, and Nordkalk Corp., which was owned by Rettig Group, were two of the principal industrial mineral producers in Finland.

Mondo was the second-ranked producer of talc, by tonnage, in the world. Mondo had its main mine and processing facilities in Sotkamo and Vuonos (Mondo Minerals, 2014b).

Nordkalk was a leading international producer of limestone (crushed and ground), concentrated calcite, quicklime, and slaked lime as well as dolomite and wollastonite, which Nordkalk extracted as a byproduct of the mining of limestone. Nordkalk had operations in 30 locations in nine countries and mines in five countries. In Finland, Nordkalk owned mines in Lappeenranta, Pargas, and Parainen (Nordkalk Corp., 2014).

First Quantum Minerals Ltd. (First Quantum) of Canada owned the Pyhasalmi copper mine. Finland was one of the few countries in Europe where copper was still mined. The Pyhasalmi Mine had been owned previously by Inmet Mining Corp.; Inmet was purchased in 2011 by First Quantum (First Quantum Minerals Ltd., 2015).

Finland's mining companies were mostly privately owned, although the Government held an equity interest in some of the major mineral producers. The mineral industry operated on a free-market basis. The country's major mineral facilities and their annual capacities are listed in table 2.

Commodity Review

Metals

Chromium.—Outokumpu announced that its plans to ramp up production of chromite at its Kemi Mine had been implemented by the fourth quarter of 2012. In 2013, chromite production increased by 131%, and in January 2014, Outokumpu updated its estimate of proved reserves at the Kemi Mine to 50.1 million metric tons (Mt) from the previously estimated 33 Mt. Outokumpu also indicated that it planned to double its ferrochrome production by 2015; in 2014, its ferrochrome output had increased by 50.7%. Outokumpu used the chromium from its Kemi chromite mine in Lapland to produce ferrochromium for its production of stainless steel at its plant in Tornio. The Kemi Mine was the only operating chromite mine located within the European Union (EU) (Outokumpu Oyj, 2014a, p. 29, 122; 2014b, p. 2).

Copper.—Boliden AB of Sweden's copper complex in Finland consisted of two plants—the copper smelter in Harjavalta, which produced copper anodes, and the copper refinery at Pori, where copper anodes were refined into copper cathodes. The complex was known as Boliden Harjavalta. The Harjavalta smelter had the capacity to produce 130,000 metric tons per year (t/yr) of copper, which was cast into copper anodes. Sulfur was recovered as a byproduct. The copper anodes were then shipped to the Pori refinery, where the anodes were refined into copper cathodes. The capacity of the refinery was 155,000 t/yr. The refinery also produced gold and silver as byproducts (Boliden AB, 2015).

Industrial Minerals

Limestone.—Nordkalk was a leading producer of limestone and limestone-based products in the world. Nordkalk's largest production site in Finland was located in Lappeenranta where the company had a quarry, a grinding plant, two flotation plants, and a lime kiln. Suomen Karbonaatti Oy, which was a subsidiary of Nordkalk, produced carbonate fillers and coating pigments and was also located in Lappeenranta (Nordkalk Corp., 2014).

Talc.—Mondo was a significant world producer of talc. In 2014, it produced an estimated 380,000 metric tons (t) of talc concentrate. Mondo indicated that the talc ore found in Finland was a mixture of magnesite and talc, so that a separating process had to be applied to the ore. Its main products were marketed as Finntalc, Microtalc, and Plustalc (table 1; Mondo Minerals, 2014a).

Outlook

The increased market interest in rare-earth minerals has reignited interest in areas of Finland that had previously been producing these minerals but had stopped because of economic and technical feasibility issues, Copper, gold, nickel, and silver production are expected to continue to be a significant element of the Finnish mineral industry, particularly as facilities are expanded to include polymetallic production projects. The Finnish Government program for 2011–15 indicates that Finland will promote the development and sustainable growth of the mineral industry, and private investment in the mining sector is likely to increase owing to the Government's support. Market prices will determine whether expansion of the Finnish mineral industry continues in the long run.

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TABLE 1
FINLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum, metal, secondary	metric tons	20,736	19,531	19,530	20,768	20,829
Chromite, concentrate, gross weight		598	693	425	982	1,035
Cobalt, refined	metric tons	9,413	10,441	10,547	10,798	12,551
Copper:						
Concentrate, gross weight	do.	51,222	47,802	104,393	145,758	163,016
Mine output, Cu content	do.	14,700	14,000	25,500 [r]	38,800	42,800
Metal:						
Smelter	do.	153,853	156,017	177,451 [r]	177,000	177,000
Refined	do.	146,344	148,639	155,021 [r]	143,524	167,879
Gold, mine output, Au content	kilograms	7,628	8,461	10,886 [r]	9,981	9,385
Iron and steel, metal:						
Ferroalloys, ferrochromium		283	231	288	434	441
Pig iron	metric tons	2,564	2,500 [r]	2,130 [r]	2,050 [r]	2,475
Steel, crude		4,023	3,985	3,759	3,517	3,807
Mercury	kilograms	9,315	--	--	--	--
Nickel:						
Mine output, Ni content	metric tons	12,100 [r]	18,800 [r]	19,100 [r]	19,300 [r]	19,700
Metal, electrolytic	do.	41,317	49,823	39,374 [r]	44,498	42,750
Platinum	kilograms	718	836	429 [r]	946	1,060
Selenium, metal	do.	66,094	88,231	92,769	72,459	93,682
Silver, metal	do.	64,751	69,344	128,200	100,890	142,360
Zinc:						
Mine output, Zn content	metric tons	55,562	64,115	52,303 [r]	40,956 [r]	44,000
Metal	do.	307,144	307,352	314,742	311,686	302,024
INDUSTRIAL MINERALS						
Cement, hydraulic		1,215	1,387	1,293 [r]	1,400	1,400
Feldspar	metric tons	28,013	26,292	43,124	47,636	46,233
Lime		463	456	450	450	460
Mica:						
Biotite		38	32	27	42	41
Concentrate	metric tons	13,809	12,896	12,112	11,244	11,973
Nitrogen, N content of ammonia	do.	78,380	72,352	78,000 [r]	78,000	78,000
Phosphate rock, apatite, concentrate:						
Gross weight		817	870	858 [r]	877	946
P_2O_5 content[e]		289	307	302 [r]	309	330
Pyrite, gross weight		706	939	993	990	990 [e]
Sodium sulfate		NA	4	-- [r]	--	--
Stone, crushed:						
Limestone and dolomite:						
Dolomite		NA	81	81	81	81 [e]
For cement manufacture		1,495	1,600	1,600	1,600	1,600 [e]
For agriculture		646	450	450	450	450 [e]
For lime manufacture		234	220	220	220	220 [e]
Fine powders		650	NA	NA	NA	NA
Metallurgical[e]		1	NA	NA	NA	NA
Total		3,030	2,400 [e]	2,400 [e]	2,400 [e]	2,400 [e]
Quartz, silica sand		267	312	257 [r]	260	260

See footnotes at end of table.

TABLE 1—Continued
FINLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued						
Sulfur:						
S content of pyrite[e]		150	338	330	330	330
Byproduct:[e]						
Metallurgy		275	280	280	280	280 [e]
Petroleum		125	133 [2]	130	130	130 [e]
Total		400	413	410	410	410 [e]
Sulfuric acid		949	887	975	975	975 [e]
Talc		419	429	396	362	380 [e]
Wollastonite	metric tons	12,100	11,500	11,500	11,500	11,500 [e]
MINERAL FUELS AND RELATED MATERIALS						
Peat:						
For fuel use		7,533	6,847	5,824 [r]	6,800	6,800 [e]
For agriculture and other uses		867	674	676	670	670 [e]
Petroleum refinery products	thousand 42-gallon barrels	88,137	90,686	106,033 [r]	109,500	109,000 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available.

-- Zero.

[1] Table includes data available through November 18, 2015.

[2] Reported figure.

TABLE 2
FINLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Ammonia		Kemira Oyj (Government, 98%)	Plant at Oulu	75
Apatite		Kemira Agro Oyj (Government, 98%)	Mine and plant at Siilinjarvi	8,000
Cadmium, metal		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	1
Cement		Finncement Oy (Irish Cement Ltd., 100%)	Plants at Lappeenranta and Parainen	1,020
Chromite		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Mine at Kemi	1,000
Cobalt		Norilsk Nickel Harjavalta (MMC Norilsk Nickel, 100%)	Plant at Kokkola	NA
Copper:				
Ore, Cu content		First Quantum Minerals Ltd.	Mine at Pyhasalmi, Kevista	10
Metal		Boliden Harjavalta AB (Boliden AB, 100%)	Smelter at Harjavalta	210
Do.		do.	Refinery at Pori	155
Feldspar		SP Minerals Oyj (Partek Corp., 50.1%, and SCR-Silbeco SA, 49.9%)	Mine and plant at Kemio	50
Ferrochrome		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Tornio	250
Gold:				
Ore, Au content	metric tons	Agnico-Eagle Mines Ltd.	Mine at Kittila	5
Do.	do.	Dragon Mining Ltd.	Mines at Orivesi and Jokisivu	4
Do.	do.	Lappland Goldminers AB	Pahtavaara Mine near Sodankyla	2
Metal	do.	Boliden AB	Smelter at Pori	4
Limestone		Nordkalk Corp. (Rettig Group, 100%)	Mines at Lappeenranta and Parainen	1,500
Do.		Rauma-Repola Oyj	Mine at Tornio	300
Mercury	metric tons	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	150
Mica		Kemira Oyj (Government, 98%)	Mine at Siilinjarvi	10
Nickel:				
Ore, Ni content		Belvedere Resources Ltd.	Mine at Hitura	30
Do.		Talvivaara Mining Co. plc.	Mine at Sotkamo	20
Metal		Norilsk Nickel Finland (MMC Norilsk Nickel, 100%)	Smelter at Harjavalta	32
Do.		do.	Refinery at Harjavalta	50
Petroleum, refinery products	thousand 42-gallon barrels per day	Neste Oil Oyj, 50%, and Government, 50%	Plants at Naantali and Porvoo	250
Phosphate-apatite		Yara International ASA.	Mine at Siilinjarvi	850
Quartz and quartzite		SP Minerals Oyj (Partek Corp., 50.1%, and SCR-Silbeco SA, 49.9%)	Mines at Kemio and Nilsia	250
Selenium	metric tons	Boliden AB	Smelter at Pori	35
Silver	do.	do.	do.	30
Steel:				
Crude		Rautaruukki Oyj (Government, 39.7%)	Plants at Halikko, Hameenlinna, Kankaanpaa, and Raahe	2,100
Do.		Fundia AB (Norsk Jenverk AS of Norway, 50%, and Rautaruukki, 50%)	Plants at Aminnefors, Dalsbruk, and Koverhar	850
Do.		Ovako AB (Triton Adviser Ltd., 100%)	Plant at Imatra	300
Stainless		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Plant at Tornio	550
Talc		Mondo Minerals Oyj (Advent International Corp., 100%)	Mines at Lahnaslampi, Lipsavaara, and Horsmanaho	500
Wollastonite		Nordkalk Corp. (Rettig Group, 100%)	Mine and plant at Lappeenranta	40
Zinc:				
Ore, Zn content		Inmet Mining Corp.	Mine at Pyhasalmi	25
Metal		Boliden AB	Smelter at Kokkola	315

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF FRANCE

By Alberto Alexander Perez

In 2014, France experienced slow economic growth. Its gross domestic product (GDP) measured at market prices was $2.829 trillion in 2014 compared with $2.810 trillion (revised) in 2013, resulting in a real GDP growth rate of 0.2%. The Government and administration of France is very centralized, and its economy is highly developed; the majority of the GDP is produced by the services industry. Household consumption was $1,521 billion[1] in 2014, which was a slight increase compared with that of 2013. The Government's expenditures in 2014 were equivalent to 57.5% of the country's GDP, and the Government's budget deficit equaled $113.2 billion, or 4% of the GDP, and contributed to an increase of the national debt, which in 2014 was to the equivalent of 95.6% of the GDP.

Employment in the private, nonagricultural sector decreased slightly, by 0.2%, most likely owing to the weak growth in economic activity. Government-subsidized labor contracts, however, increased, particularly in the form of the so-called "jobs for the future," which also included jobs in the education sector. As a result, total employment increased on average by 0.3% compared with that of the previous year, and the unemployment rate in 2014 was 10.4%.

There is no metal mining in the country anymore. Deposits that were important for the country's economy in the past were no longer economically viable for production. The country was a significant processor of raw mineral materials and a manufacturer and consumer of industrial durable goods. France's heavy industries—which, among other product categories, produced automotive and aviation products, chemicals, and machine tools for domestic consumption and export—relied mainly on imported metal ores and concentrates, industrial minerals, and mineral fuels. France had the third largest GDP in the European Union (EU) after Germany and the United Kingdom. The output value of France's industrial sector, not including construction, accounted for $1,194 billion, or 19.4% of the GDP in 2014, and the construction sector contributed an additional $367.5 billion (U.S. Central Intelligence Agency, 2015; The World Bank, 2015; Institut National de la Statistique et des Études Économiques, 2016, p. 3, 9, 15, 21).

Minerals in the National Economy

The contribution of the mineral industry to France's economy, excluding France's overseas Departments, which are treated in this volume as separate entities, is small. The value of the production of mining and quarrying, energy, water, waste management and remediation sector (as defined by the Institut National de la Statistique et des Études Économiques) amounted to $201 billion in 2014, and that of the refining of petroleum products and the manufacture of coke was $64.6 billion, which combined represented 9% of France's GDP. The contribution of France's construction sector was more significant, accounting for 13% of the total GDP. France's total industrial output, including construction, amounted to 32.4% of the GDP. Because of the size and structure of France's economy, the upstream input of minerals was key to the continued maintenance and growth of the country's heavy industries (Institut National de la Statistique et des Études Économiques, 2016, p. 21).

Government Policies and Programs

In 2014, the Ministère de l'Écologie, du Développement Durable et de l'Énergie [Ministry of Ecology, Sustainable Development, and Energy] was still considering the changes proposed to the French mining law in 2013, and at the end of the year, was still consulting with its governmental partners and the public (Ministère de l'Écologie, du Développement Durable et de l'Énergie, 2015). The previous Ministère de l'Économie, du Redressement Productif et du Numérique [Ministry of the Economy, Economic Reactivation and the Digital Economy] had proposed the creation of a Government entity—Compagnie Nationale des Mines de France [National French Mining Company] (CMF)—that would develop and promote mining interests in France. The idea was well received by the international mining industry, and in 2013, France extended the first exploration permits in 30 years, seemingly signaling a resumption of large-scale mining in continental France. By the end of 2014, the new minister and the current Government were evaluating the creation of the CMF and modifying the mining law (Bureau de Recherches Géologiques et Minières, 2015; Les Echos, 2015).

France's mining code was last modified on March 1, 2011; however, it was not implemented until January 25, 2014. Most of the changes sought to simplify the exploration and development licensing process (Legifrance, 2015).

Production

In 2014, production increased for the following mineral commodities: indium, by 30%; chalk, 21%; kaolin, 19%; zinc metal, 13%; ferromanganese, 12%; carbon black, 11%; pig iron, 6%; hot-rolled steel, 5%; primary aluminum, 4%; crude steel, 3%; and refined lead, 1%. Production decreased for the following mineral commodities: natural gas, by 50%; crude dolomite, 35%; crude granite, 32%; refined nickel, 31%; cobalt metal, 29%; lime 15%; sand, gravel, and aggregates 12%; limestone, 8%; crude petroleum, 6%; gypsum, 5%; alumina, 5%; marble, 4%; and nitrogen, salt and slate, by 1% each. Economic growth in France continued to be slow, and the construction and manufacturing sectors were affected. Production of many industrial minerals decreased, especially that of construction materials. Production of natural gas and crude petroleum continued to decrease as the resources were exhausted and no new resources had been found (tables 1, 2).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US) at an average rate of EUR0.75=$1.00 for 2014.

Mineral Trade

In 2014, France exported $596 billion in goods and imported $638.8 billion for a negative trade balance of $42.9 billion. France's export sectors that showed a positive trade balance were transportation equipment ($129 billion in exports and $91.2 billion in imports, for a net balance of $37.8 billion); food products, beverages, and tobacco products ($59 billion in exports and $50.3 billion in imports, for a net balance of $8.7 billion); and agriculture, forestry, and fisheries ($20.7 billion in exports and $16.3 billion in imports, for a net balance of $4.4 billion). France's mining and quarrying, energy, and water sector, including waste management and remediation services, exported $15.1 billion worth of goods and services and imported $65.6 billion for a negative trade balance of $50.5 billion. The coke and refined petroleum products sector exported $21.8 billion and imported $38.9 billion for a negative balance of $17.1 billion (Institut National de la Statistique et des Études Économiques, 2015a, p. 25; 2015b).

The United States was a leading commercial partner of France outside the EU, and in 2014, it supplied about $31.3 billion worth of goods and services to France, including civilian aircraft, engines, equipment and parts valued at $8.27 billion; fuel oil, $3.9 billion; pharmaceutical preparations, $2.2 billion; medicinal equipment, $980 million; and industrial machines, $874 million. United States exports of mineral-industry-related commodities to France, with the exception of energy-related commodities, included nonferrous metals valued at $425 million; gem-quality diamond, $238 million; metallurgical-grade coal, $221 million; manufactured mineral supplies, $204 million; aluminum and alumina, $120 million; iron and steel products (other), $81 million; iron and steel mill products, $72 million; and precious metals, $60 million (U.S. Census Bureau, 2015a).

The most significant United States imports from France in 2014 included civilian aircraft engines valued at $5.7 billion; civilian aircraft, $4.7 billion; pharmaceutical preparations, $2.7 billion; artwork and antiques, $2.5 billion; toiletries and cosmetics, $2 billion; alcoholic beverages, excluding wine, $2 billion; civilian aircraft parts, $1.7 billion; wine, beer, and related products, $1.5 billion; industrial machines, $1.3 billion; and petroleum products, 1.2 billion. United States imports of mineral-industry-related commodities from France, with the exception of energy-related commodities, included iron and steel mill products valued at $454 million; finished metal shapes, $393 million; bauxite and aluminum, $133 million; nonferrous metals, $106 million; nickel, $30 million; gem-quality diamond, $27 million; and nonmonetary gold, $16 million (U.S. Census Bureau, 2015b).

Structure of the Mineral Industry

In 2014, the role of the Government in the functioning of the mineral industry was principally through its Ministry of Ecology, Sustainable Development, and Energy and the French mining code, which was last updated in 2011. The Ministry of Ecology, Sustainable Development, and Energy was responsible for overseeing and regulating such environmental issues as agricultural runoff, air pollution from industrial and vehicle emissions, forest damage from acid rain, and water pollution from mining, mineral processing, and urban waste. The Bureau de Recherches Géologiques et Minières [Bureau of Geological and Mining Research] (BRGM) was France's geological survey and it was the institution that performed and developed geologic and mineral research in France and abroad; the headquarters were located in Orleans. In 2014, the Government maintained partial ownership of the country's electricity generation company, Electricité de France S.A. (EDF), and its natural gas production and distribution facilities company, Engie S.A., as well as ownership of the national rail company, Société National des Chemins de Fer Française (SNCF), and public transportation companies at the national level. France's leading mineral-producing companies, which had operations in France and abroad, included Imerys Group, which was a major producer of industrial minerals. Imerys mined and processed ball clays, carbonates, feldspar, and red clays domestically and from deposits in such countries as China, Germany, Spain, the United States, and Vietnam for domestic use and export. Imerys also owned Talc de Luzenac S.A., which was a leading talc-producing company in the world market. Table 2 provides data on the major enterprises that produced metals, industrial minerals, and mineral fuels in France in 2014 (Imerys S.A., 2015a, p. 17).

Commodity Review

Metals

Aluminum.—In September, TRIMET Aluminum SE of Germany (TRIMET) launched its production line F to which electrolytic cells were added and put into operation. The plant, which was located at Saint-Jean-de Maurienne in Savoi, was decommissioned in 2009 and started repairs when it was acquired from Rio Tinto in December 2013. With the reopening of the new line, the Saint-Jean-de Maurienne plant's production capacity would increase to about 145,000 metric tons per year (t/yr).

TRIMET announced that the commissioning of production line F was part of a comprehensive investment program that would cost about $134 million and would last for the next 3 years. TRIMET announced that it intended to restore the full production capacity of the Saint-Jean-de Maurienne plant and create additional jobs. TRIMET purchased the aluminum smelter and its partner site at Castelsarrasin in December 2013 from Rio Tinto Alcan. The company employed about 500 people at both sites. The company aligned production to develop material solutions for the automotive and energy industry. TRIMET created TRIMET France SAS as the operating company for the two plants and the French energy company, Electricité de France (EDF) held a minority stake in the company (TRIMET Aluminium SE, 2014).

In 2014, Alteo Holdings owned and operated the alumina plant at Gardanne, which was the first plant in the world to use the Bayer process for the refining of alumina. The plant imported about 3,000 metric tons per day of bauxite, shipped more than 1,200 t of its products daily, and had the capacity to produce 635,000 t/yr. The company's investments in the plant included improving the product grinding and storage facilities, installing six-sigma and lean management systems, and reducing environmental emissions, such as CO_2, dust, and SO_2 (Alteo Holdings, 2016).

Indium and Zinc.—Nyrstar S.A. of Belgium (Nyrstar) owned and operated the Auby smelter in northwestern France, near the city of Lille. During the last quarter of 2014, Nyrstar started to expand indium metal production at Auby; the modifications were expected to be completed during the second half of 2015. These modifications included deconstraining projects, including increasing the silica constraint in concentrates to allow increased indium throughput and recovery. The Auby plant achieved new production records in both zinc metal and indium metal production in 2014. The roaster and the indium plant were shut down during the second half of 2014, which led to lower indium production during this period.

The increases in production were in line with an increased demand for zinc and indium on the world markets. The Auby smelter (an electrolytic zinc smelter) produced cathodes as finished products rather than ingots. Zinc concentrates were the primary source material for the plant; however, secondary zinc materials were used in the roast leach, electrolysis (RLE) smelting process to produce the zinc cathodes. In 2014, the Auby smelter produced 172,000 t of zinc metal.

The Auby smelter had also operated an indium metal production facility since 2012. Auby's zinc concentrates were sourced from suppliers worldwide. Nyrstar reported that the Auby smelter could process a high percentage of secondary feed material without adversely affecting the productivity, efficiency, or residue output of the plant. The concentrates that the plant used were transported by barge from the Port of Antwerp, and the secondary zinc feed materials were delivered by truck. The Auby plant also produced byproducts of sulfuric acid, Auby leach product (a product containing both lead and silver), copper and indium cement, and indium metal (Nyrstar S.A, 2015a, b).

Iron and Steel.—ArcelorMittal of Luxembourg was the leading steel company in France in 2014, with a workforce of nearly 20,000 at about 50 industrial and distribution sites. The company announced that it would create 700 new jobs at its French sites in 2014. The new permanent jobs would cover a wide range of activities and would be in addition to the 600 jobs created in 2013, mostly at the company's Desvres, Dunkerque, Mardyck, and Montataire sites in northern France.

ArcelorMittal designed and manufactured advanced steels in France; its plants had become the group's leading production centers for steel used in the automotive and energy sectors. The company's largest research and development center was located in Maizieres, France. ArcelorMittal has invested more than $2.7 billion since 2006 in steel production in France, and the company has continued to make regular investments at all its sites. In particular, ArcelorMittal had invested $140 million in the plant at Florange, which employed 2,200 people, and it planned to invest a total of $240 million by 2017. ArcelorMittal also announced that it had invested $123 million to renovate a blast furnace at Dunkerque and $120 million to develop the production of electrical steels at the St-Chely d'Apcher site at Lozere (ArcelorMittal, 2014).

Industrial Minerals

Cement.—In April, Lafarge S.A. (Lafarge) announced its merger with Holcim S.A. of Switzerland, which was expected to be finalized in the first half of 2015. In December, Lafarge announced the composition of the executive committee of the new combined company.

Lafarge announced that while the companies awaited regulatory approvals, the new company, LafargeHolcim, would combine operations and that its production sites would be located in 90 countries across all continents. The new company's board would be composed of equal numbers of Lafarge and Holcim directors and distribute its central corporate functions in France and Switzerland. Lafarge stated that no country would account for more than 10% of the revenues of the new company and that LafargeHolcim would be listed on the SIX Swiss stock exchange in Zurich and the Euronext stock exchange in Paris; however, the new company would be domiciled in Switzerland and would operate under the Swiss local governance rules. Prior to the merger, Lafarge was one of France's leading cement manufacturers, employing about 64,000 employees worldwide (Lafarge, 2014a, b).

Italcementi S.p.A. of Italy announced in June that it would purchase the remaining stock in Société des Ciments Français and would completely absorb the company and delist it from the Euronext stock exchange in Paris. The company was delisted on July 15, making official the complete inclusion of Société des Ciments Français into Italcementi. The company was evaluating its options, as the cement market seemed to be consolidating. Italcementi was the fourth-ranked producer of cement in the world after LafargeHolcim, HeidelbergCement of Germany, and CEMEX S.A. of Mexico (Global Cement, 2014; Les Echos, 2014a, b).

The Vicat Group's total sales rose by 6% in 2014 to $3.23 billion from $3.06 billion in 2013. Vicat reported that its worldwide cement sales rose by 13.7% in 2014 to $1.68 billion. The increase was attributed to increased construction in markets in Asia and to market improvements in Egypt and the United States. Vicat reported that cement sales in France decreased by 4.4% in 2014 to $475 million, and that sales in the remainder of Europe decreased by 5% to $232 million. In the United States, cement sales increased by 16.7% to $152 million: in Asia (including India, Kazakhstan, and Turkey), sales increased by 20% to $622 million; and in Africa and the Middle East, sales increased by 23% to $499 million. In 2014, Vicat had five cement plants in France with a total production capacity of 6 million metric tons per year (table 2; Global Cement, 2015).

Kyanite and Related Minerals (Andalusite).—In 2014, Imerys, S.A. was the world's leading andalusite producer. The company opened a new pit at Glomel; however, it did not release production data. The new pit supported kerphalite production. The beneficiation process used by Imerys Refractory Minerals Glomel, which was the operating entity at the site, allowed the production of high-purity andalusite products that were suitable for a wide range of applications. Andalusite is a component of both shaped and unshaped refractories, and it is widely used in the technical ceramics and sand-casting industries (Industrial Minerals, 2014; Imerys, 2015b).

Mineral Fuels and Other Sources of Energy

In 2014, the production of nuclear energy, measured in terawatthours (TWh), increased by 3% compared with that of 2013 and accounted for 77.4% of total electricity production in France. France's hydroelectric, wind, and solar electricity production decreased by 6.2% in 2014 compared with that of 2013, and thermal production of electricity decreased by 33.9% compared with that of 2013. The total amount of electricity produced in 2014 decreased by 2%; however, consumption of electricity decreased by 6.2%, and France's exports of electricity increased by 25% (Institut National de la Statistique et des Études Économiques, 2015b). The leading consumers of energy in France in 2014 were the residential sector, 68.0%; the industrial sector, 24.7%; the transportation sector, including urban and national train systems, 2.9%; the manufacturing sector and steelmaking industries, 2.4%; and the agricultural sector, 2% (Institut National de la Statistique et des Études Économiques, 2015a).

Outlook

France is principally a processor of minerals, and as such, the domestic and international rate of consumption of manufactured goods that use processed mineral commodities is the principal engine of its mineral industry. Economic growth in the United States and China would increase the demand for France's mineral products, as the economies of the member countries of the EU continue to be flat. France will likely continue to import many of the ores and raw minerals it needs for its manufactured goods industry in the near future, as the Government has decided not to resume mining in metropolitan France. Nuclear power will likely remain the focus of the Government's energy generation strategy for the near future, although increasing its sources of renewable energy continues to be a stated objective of the Government.

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TABLE 1

FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Alumina, metallurgical, gross weight[e]	thousand metric tons	481	470	430 [3]	315	300
Metal:						
Primary	do.	356	334	349	346	360
Secondary	do.	184	191	184	180	180
Cadmium metal[e]		50	--	--	--	--
Cobalt, metal:		302	354	350	308	219
Indium	kilograms	--	--	13,000 [r]	33,000 [r]	43,000
Iron and steel, metal :						
Pig iron	thousand metric tons	10,137	9,698	9,532	10,276	10,866
Ferroalloys, electric furnace:[e]						
Ferromanganese	do.	138	131	101 [r]	104 [r]	116
Ferrosilicon	do.	32 [r]	72 [r]	63	50	50
Silicomanganese	do.	62	63	69 [r]	65 [r]	65
Silicon metal	do.	112	104 [r]	95	100	100
Other	do.	60	60	60	60	60
Total	do.	400	430 [r]	380 [r]	380 [r]	391
Steel:						
Crude	do.	15,414	15,780	15,609	15,685	16,143
Hot-rolled	do.	13,581	13,715	13,529	14,716	15,464
Lead, refined, secondary:[e]		71,000 [r]	80,000 [r]	83,000 [r]	71,000	72,000
Nickel, refinery products, Ni content[4]		12,900 [r]	13,700	13,200 [r]	12,100 [r]	8,400
Zinc metal, including slab and secondary		163,000	164,000	161,000	152,000	171,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	17,733	19,270	17,810 [r]	18,018	18,000
Gypsum and anhydrite, crude[e]	do.	3,440 [3]	4,231	3,685 [3]	3,455	3,279
Kaolin and kaolinitic clay (marketable)	do.	315	315	315	267	317
Lime, quick and hydrated, dead-burned dolomite[e]	do.	4,000	4,000	4,000	3,371 [3]	2,864
Nitrogen, N content of ammonia[e]	do.	3,517 [3]	3,500	2,644 [3]	2,640 [r]	2,600
Pigments, mineral, natural, iron oxide[e]		1,000	1,000	900 [r]	900	900
Salt, all sources[e]	thousand metric tons	5,867 [3]	5,430	5,457	5,893	5,809
Stone, sand and gravel:						
Chalk	do.	1,765	2,733	1,702	2,214	2,677
Dolomite, crude	do.	700	393	423	647	418
Granite, crude	do.	426	482	233	289	197
Limestone, agricultural and industrial	do.	9,102	10,666	10,216	9,721	8,985
Marble and travertine, crude[e]	do.	150	150	150	23	22
Sand and gravel:						
Industrial sand		8,498	6,286	8,880	8,752	7,835
Other sand, gravel, and aggregates		249,512	277,521	251,015	260,524	230,216
Slate, crude[e]		8,700	8,700	8,700	7,081	7,000
Talc, crude[e]	thousand metric tons	420	420	420	450	450

See footnotes at end of table.

TABLE 1—Continued
FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
MINERAL FUELS AND RELATED MATERIALS						
Carbon, black	thousand metric tons	203,563	134,329	134,000	105,041	116,863
Gas, natural, marketed	million cubic meters	1,245	1,132	538[r,3]	339[r]	169
Petroleum:						
Crude:	thousand 42-gallon barrels	6,606	6,508	5,949	5,840	5,475
Refinery products:						
Liquefied petroleum gas	do.	24,346	24,300	16,973	17,155[r]	17,100[e]
Gasoline, all kinds	do.	115,596	115,000	100,740	91,615[r]	91,600[e]
Kerosene and jet fuel	do.	35,113	35,100	29,930[r]	33,580[r]	33,600[e]
Distillate fuel oil	do.	224,950	224,900	194,801	191,260[r]	191,000[e]
Residual fuel oil	do.	59,313	59,300	52,962	43,435[r]	43,400[e]
Other products	do.	106,617	106,600	86,578	86,870[r]	86,800[e]
Total	do.	565,900	565,200	481,984[r]	463,915[r]	463,500[e]

[e] Estimated; estimated data rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through January 7, 2016.

[2] In addition to the commodities listed, France produced abrasives, antimony, asphaltic material, bauxite, coal briquets, metallurgical coke, diatomite, feldspar, germanium, kyanite, mica, pumice, refractory clays, sandstone, sodium compounds, sulfur, synthetic industrial diamond, and Thomas slag, but actual output was not regularly reported, or as in the case for bauxite, it was produced but not intended for metallurgical use. The available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Excludes secondary production from nickel-cadmium batteries.

TABLE 2
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, metallurgical		Alteo Holdings (100%)	Plant at Gardanne	635
Aluminum		Rio Tinto Ltd.	Dunkerque, Calais du Nord	270
Do.		Trimet Aluminium SE, 65%, and Electricité de France S.A. (EDF), 25%	Saint-Jean-de-Maurienne, Savoie	145
Andalusite		Imerys, S.A.	Glomel Mine, Brittany	75
Antimony, metal		Produits Chimiques de Lucette	Plant at Le Genest, Mayeene Province	15
Barite		Barytine de Chaillac	Mine and plant at Chaillac	150
Do.		Société Industrielle du Centre	Mine at Rossigno, Indre Province	100
Cement		Four companies:	80 plants, including:	26,700
Do.		Lafarge S.A.	14 plants, the largest of which is at St. Pierre-la-Cour (1,160)	10,000
Do.		Société des Ciments Français (Italcementi S.p.A.)	9 plants, the largest of which is at Gargenville (1,100)	7,500
Do.		Vicat Group	5 plants	6,000
Do.		Holcim Ciments S.A.S	9 plants	5,900
Clay, kaolin		Groupe Mineral Harwanne (GMH)	Kaolin d'Arvor Mine, Quessoy	300
Cobalt, metal	metric tons	Société Métallurgique le Nickel (SLN)	Plant at Sandouville, near Le Havre	600
Copper, metal		Compagnie Générale d'Électrolyse du Palais	Electrolytic plant at Palais-sur-Vienne	45
Diatomite		Ceca S.A.	Mines and plants at Riom-les-Montagnes and St. Bauzille	100
Feldspar		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine and plant at St. Chely d'Apcher	55
Ferroalloys		Comilog Dunkerque (ERAMET Group, 100%)	Dunkerque	70
Do.		FerroPemS.A. (Grupo Ferro Atlantica, 100%)	6 plants	290
Do.		Glencore Manganese France S.A. (Glencore plc., 100%)	Plant at Dunkerque	140
Gypsum		S.A. de Matériel de Construction	Mine at Taverny	1,500
Indium		Nyrstar S.A.	Plant at Auby	48
Iron and steel, steel		ArcelorMittal Group	Fos-sur-Mer	4,200
Do.		do.	Florange[1]	3,200
Do.		do.	Gandrange, Neuves Maisons	8,400
Mica		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine at Ploemeur, Brittany	160
Natural gas	million cubic meters	Total Group	Gasfield and plant at Lacq	20,000
Nickel, metal		Société Métallurgia le Nickel (SLN)	Plant at Sandouville	16
Nitrogen, N content of ammonia		GPN S.A	Plant at Grandpuits	390
Petroleum:				
Crude	42-gallon barrels per day	Total S.A.	Paris basin oilfields	1,000
Refined	do.	do.	Refineries at Gonfreville and La Mede	446,000
Do.	do.	Petroplus S.A.	Refinery at Petite Couronne	285,000
Do.	do.	Total S.A.	Refinery at Feyzin	120,000
Do.	do.	do.	Refinery at Donges	200,000
Do.	do.	do.	Refinery at Grandpuits	96,000
Do.	do.	Ineos Group Ltd.	Refineries at Lavera	175,000
Do.	do.	Esso S.A.	Refineries at Fos-sur-Mer	62,000
Do.	do.	do.	Refineries at Gravenchon	237,000
Do.	do.	Cie. Rhenane de Raffinage (CRR)[2]	Refinery at Reichstett	80,000
Salt		Compagnie des Salins du Midi et des Salines de l'Est (Salins Group)	Mines and plants at Aigues-Mortes, Dax, Salin-de-Giraud, and Varangeville	2,500
Sulfur		Total Group	Byproduct from natural gas, gasfield and plant at Lacq	3,000
Talc		Talc de Luzenac S.A. (Imerys S.A., 100%)	Trimouns Mine near Ariege, Pyrenees	450
Zinc, metal		Nyrstar S.A.	Plant at Auby	172

Do. do., Ditto.

[1] The Florange blast furnace was idle for all of 2012.

[2] Production operations terminated; conversion to petroleum product distribution in 2012.

THE MINERAL INDUSTRY OF GEORGIA

By Elena Safirova

Prior to the proclamation of Georgia's independence in 1991, a range of mineral commodities were mined in Georgia, including arsenic, barite, bentonite, coal, copper, diatomite, lead, manganese, zeolites, and zinc. The country's metallurgical sector produced ferroalloys and steel. Production of many of these mineral commodities ceased or had been significantly reduced since 1991 because many supply chains were severed after the disintegration of the Soviet Union.

In the middle of the past decade, the Government of Georgia sought to position the country as a transit hub between Europe and Asia. As a result, the country emphasized making improvements to its transportation and energy infrastructure and logistics systems. In 2014, Georgia continued the modernization and partial construction of its East-West gas pipeline; several new gas network links were to be constructed. In particular, they included a 20-kilometer (km)-long Gori-Kareli link, a 23-km long Zestafoni-Kutaisi link, and a 76-km long Kutaisi-Senaki link. The $78 million project was funded in 2010 by the U.S. Agency for International Development (USAID) and was aimed at increasing energy security in the country. The project was directed by the Ministry of Energy and Natural Resources, Georgia Oil and Gas Corp. (GOGC), and USAID (Bizzone.info, 2014b).

In 2008, the State Oil Company of Azerbaijan Republic (SOCAR) opened a new Kulevi Oil Terminal with the capacity to move 10 million metric tons per year (Mt/yr) of petroleum products, which was to be expanded to 20 Mt/yr in the future. The terminal was able to load and unload 100,000-ton tankers, and its initial reservoir park had a capacity of 320,000 cubic meters. Since 2008, the terminal had continuously expanded its functionality and capacity—the terminal started transshipments of crude petroleum in 2010; it first received compressed natural gas in 2012; and SOCAR was planning to construct a new reservoir park, in 2015, which would include 5 reservoirs with a total capacity of 70,000 cubic meters as well as a rail terminal capable of loading and unloading 26 railway tankers simultaneously (Gasanov, 2008; BlackSeaNews.net, 2012; 2015; Salaeva, 2015).

In 2007, the Government decided to stop importing natural gas from Russia and to import most of its natural gas from Azerbaijan. In 2013, members of the new Government thought that reliance on a single source for such an important energy product could be risky, and they were developing some alternative sources of natural gas. The options included obtaining natural gas from Kazakhstan, Turkmenistan, and, possibly, Iran with the goal of supply diversification. The Government even considered the possibility of purchasing gas from Russia. As of 2014, however, the country continued to import natural gas solely from Azerbaijan (Kikaleishvili, 2013).

In October, a new hydropowerplant, which is located on the Paravani River at the border with Turkey, started operations. The powerplant was built by Georgian Urban Energy LLC (a subsidiary of the Anadolu Group of Turkey) and cost the company $200 million to build. With a total capacity of 87 megawatts (MW), the new powerplant was the largest among all powerplants built in the country in the past 35 years. The company expected that the energy produced at the Paravani powerplant would be consumed domestically during the winter, and it would be exported to Turkey in the summer (AFN.by, 2014).

Minerals in the National Economy

In 2014, the nominal gross domestic product (GDP) of Georgia increased by 2.4% to $16.5 billion[1] compared with that of 2013. The country's real GDP increased by 4.8% in 2014 compared with that of 2013. The share of industrial production in the GDP in 2014 was 17.1%, and mining and quarrying accounted for 4.1% of the value of industrial production. In 2014, the real value of production in mining and quarrying increased by 1.8%, whereas the real value of manufacturing production increased by 3.9%, indicating that Georgia's economy was growing after the economic reforms of the previous decade, but that the mining sector continued to lag other sectors of the economy (National Statistics Office of Georgia, 2015c; U.S. Central Intelligence Agency, 2015).

In 2014, foreign direct investment (FDI) increased by 35% to $1,272 million from $942 million in 2013, and the share of reinvestments in total FDI was 21%. The Netherlands was the leading investor in Georgia (having provided 26% of the total FDI in 2014), followed by Azerbaijan (24%), China (15%), the United Kingdom (9%), Luxembourg (7%), the United States (6%), and Turkey and Russia (5% each). In 2014, the FDI in the energy sector was $99 million, or 8% of the total, and that in the mining sector was $48 million, or 4% of the total; compared with the FDI in 2013, this was a 60% decrease for the energy sector and a 9% increase for the mining sector (National Statistics Office of Georgia, 2015b).

Government Policies and Programs

In 2014, the Georgian National Regulatory Commission on Energy and Water (GNERC) developed a new methodology for computing natural gas rates. The new methodology was to comply with the new Law on Natural Gas and Electric Energy, and was to bring energy price formation in line with the economic principles of utility regulation and with existing international practice. The underlying principle of the new methodology was "cost plus," which would establish a fare rate that would protect consumers and ensure highquality standards and the stability of utility companies. The new rates were expected to go into effect in January 2015 (Nor.ge, 2015).

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[1] Where necessary, values have been converted from Georgian laris (GEL) to U.S. dollars (US$) at an annual average exchange rate of GEL1.766=US$1.00 for 2014 and GEL1.655=US$1.00 for 2013.

Starting in November 2014, the natural gas network hookup fee for residential users was reduced to 400 laris ($229) from 600 laris ($343). As before, the customers were able to spread out the payment over a period of 16 months. The Ministry of Energy planned to provide natural gas hookups for 86,000 households in 2014. The actual work of providing access to the natural gas network was done by SOCAR Georgia Gas, which was a subsidiary of SOCAR Energy Georgia (Lomidze, 2014a).

Production

About one-half of the 2014 production data in table 1 were estimated because data for many mineral commodities were not available. Production of natural gas increased by 85% and that of nitrogen increased by an estimated 6.7%. At the same time, production of gold decreased by an estimated 40%; that of crude oil, by 27.5%; coal, by 21.0%, steel rebar, by 10%; silver, by an estimated 9.1%; and salt, by an estimated 6.7%. These and other production data are in table 1.

Structure of the Mineral Industry

Table 2 is a list of enterprises engaged in mineral production.

Mineral Trade

In 2014, Georgia ran a substantial trade deficit—the total value of its exports ($2.86 billion) was greatly exceeded by the total value of its imports ($8.60 billion). The country's major export trade partners were, in descending order of value, Azerbaijan (which received 19.0% of Georgia's exports), Armenia (10.1%), Russia (9.6%), Turkey (8.4%), the United States (7.3%), Bulgaria (5.7%), Ukraine (4.9%), China (3.2%), Kazakhstan (3.1%), and Italy (3.0%). Its major import trade partners were, in descending order of value, Turkey (which supplied 20.1% of Georgia's imports), China (8.5%), Azerbaijan (7.4%), Russia (6.7%), Ukraine (6.4%), Germany (5.4%), Japan (4.3%), Romania (3.6%), the United States (3.3%), and Italy (2.6%). Mineral commodities, especially metals, played a significant role in the country's exports. Ferroalloys accounted for 10.0% of the country's total export value; copper ores and concentrates, 8.7%; nitrogenous minerals or chemical fertilizers, 4.8%; and bars and rods of iron, 2.2%. Among the country's imports, the largest category was refined petroleum and petroleum oils, which made up 10.7% of the total. Petroleum gases contributed another 4.3% and copper ores and concentrates, 1.9% (National Statistics Office of Georgia, 2015a).

Commodity Review

Metals

Copper and Gold.—In 2012, GeoProMining, Ltd. (GPM) of Russia had sold both of its Georgian holdings—JSC Madneuli and Quartzite Ltd.—to Rich Metals Group (RMG) of Russia for a total of $120 million. The new owner renamed the two companies RMG Copper (formerly JSC Madneuli) and RMG Gold (formerly Quartzite Ltd.). In February 2012, the Ministry of Energy and Natural Resources conducted an auction for the right to mine ore deposits in Sakdrisi, Bolnisi region. As a result of the auction, RMG obtained the license to mine the deposit (Apsny.ge, 2012a, b).

Eight years earlier, in 2004, Georgian and German archeologists discovered one of the oldest gold mines in the world, which is thought to be about 5,000 years old. Subsequently, in 2006, the mine was awarded the status of an archeological cultural heritage monument. In October 2013, however, the Government annulled the status of the archeological cultural heritage monument and declared that the status was awarded illegally. Some members of the public disagreed with the October 2013 decision and appealed the decision. In June 2014, the Tbilisi City Court decided to order RMG Gold to halt mining operations in Sakdrisi until the final court decision. The Court argued that mining activities could permanently damage the old mine and destroy its archaeological value. In December, the Ministry of Culture and the National Agency for Protection of Cultural Heritage issued decrees that removed the status of cultural heritage from the Sakdrisi Mine, but the mine retained the status of an archaeological object. At the same time, the Government decided to support the RMG workers and to grant permission to continue mining in the area. The Government stated that the RMG promised to build an archaeological museum that would preserve all objects that might be found on the site (Apsny.ge, 2014a; EurasiaNet.org, 2014; Israelyan, 2015).

Iron and Steel.—In 2014, Georgia had four steel plants, all of which specialized in the production of steel reinforcing products (mostly rebar) from metal scrap. The Rustavi metallurgical plant, which was built in 1940, was the oldest plant. In addition to rebar, it produced pig iron, seamless pipes, ferroalloys, and other finished steel products. GeoSteel LLC, which was also located in the city of Rustavi, was a joint venture between JSW of India and Georgian Steel Holding Group of Georgia. As of yearend 2014, GeoSteel was the largest steel plant in Georgia and had capacity capacity to produce 175,000 metric tons per year (t/yr) of steel. GeoSteel specialized in the production of thermomechanically treated construction steel rebar, and its products were used to construct bridges, multistory buildings, and hydropower plants. The Kutaisi metallurgical plant, which was built in 2008, was a joint venture with OOO Eurasia Steel of India and had a design production capacity of 100,000 t/yr of rebar. Finally, Moulds and Metals Georgia Ltd. metallurgical plant in Poti was built in 2012 at a cost of $12,000. The company was planning to expand the plant in the next few years at a cost of $35 million. At design capacity, the plant was expected to employ a total of 220 people (SteelOrbis.com, 2010; EkhoKavkaza.com, 2012; Deloros.ru, 2014).

Over the past several years, the Rustavi steel plant was in the midst of an ownership dispute. After the death of the previous owner of the plant in 2008, according to the decision of the Tbilisi City court, the plant's ownership was transferred to AO Georgian Steel instead of the family of the deceased, which inherited OOO Rustavi Steel. Later, multiple courts made several more decisions about the ownership of the plant, and the plant's ownership was moving between Georgian Steel and Rustavi Steel. In February 2014, the Tbilisi City court seized all the plant's assets, including raw materials and inventories of finished products, until the plant paid off its debt of $4,500 laris (about $2,600). As a result, the Rustavi steel plant essentially had to halt its operations and the workers were to be placed on unpaid leave. By yearend, it was still not clear if and when the plant would be able to resume operations (Bizzone.info, 2013; Gazeta.ru, 2013; GeorgianPress.ru, 2015; Kmuzov, 2015; Transparency.ge, 2015).

Industrial Minerals

Cement.—As of the beginning of 2014, HeidelbergCement AG owned three cement plants and four concrete plants in Georgia. The three cement plants had a production capacity of 2 Mt/yr of cement. In October 2013, HeidelbergCement started a modernization project at its Rustavi plant. The major part of modernization was the installation of a new separator that would improve the quality of cement and expand the variety of products. In particular, the new separator would allow the plant to produce cement for construction and infrastructure elements that require special stability; previously, Georgia's cement plants did not have the equipment to produce cement with such characteristics. The company invested a total of about 4 million laris ($2.3 million) and completed construction in May 2014. HeidelbergCement also planned to modernize its cement plant in Kaspi and to build a new plant in Poti in the near future (Lomidze, 2014c; VestnikKavkaza.ru, 2014).

In April, Leader Cement LLC of Georgia and LaFarge S.A. of France announced their plan to build a new cement plant in the port city of Poti, which would cover an area of 40,000 square meters, would have the capacity to produce 250,000 t/yr of cement, and would employ 50 people. The first stage of construction would cost $10 million; the companies did not disclose when the construction was to be completed (Apsny.ge, 2014b; Concrete-union.ru, 2014; Lomidze, 2014b).

Mineral Fuels

Petroleum and Natural Gas.—In 2014, Georgia produced 41,334 t (300,500 barrels) of crude petroleum and exported all of it because the country did not have an operational oil refinery. As of yearend 2014, Georgia had about 1,500 petroleum deposits of various sizes; however, only 14 of them were producing crude oil. Five companies were engaged in oil production in Georgia, including three foreign companies—Black Oil and Gas of the United Kingdom, Frontera Eastern Georgia of the United States, and Jindal Petroleum Ltd. of India. The domestic companies producing petroleum were Georgian Oil and Gas Corp. (GOGC) and VP Georgia LLC (Bizzone.info, 2014a; Apsny.ge, 2015).

The country was divided into 25 petroleum licensing blocks. Since 1996, Georgia issued exploration licenses to 18 companies. In particular, Anadarko Petroleum Corp. of the United States explored Georgia's sea shelf and found several large deposits. The discoveries, however, did not lead to development because at the time the projects were considered too risky. As of yearend 2014, there was no oil exploration or production from the Georgia sea shelf, but the Government planned to hold new tenders in 2015 (Apsny.ge, 2015).

In June, Frontera Resources Corp. of the United States started natural gas production at the Mtsare Khevi deposit, which was located close to the village of Iormuganlo in the Sagarejo region of eastern Georgia. The company had a 25-year license for oil and gas production in Block 12, which covered an area of 5,000 square kilometers. The company had been working in Georgia since 1997 and had formed a joint venture, Frontera Eastern Georgia, with AO Gruzneft. Since then, Frontera reexplored several deposits, including the Baida, Mirzani, Muare Khevi, Nazarlebi, Patara Shiraki, and Taribana deposits. The development of the Mtsare Khevi deposit started in 2011, and Frontera invested about $400 million into the project. The deposit's resources were estimated to be 42 billion cubic meters of natural gas, and the company expected to produce about 75,000 cubic meters per day of natural gas (Interfax.ru, 2014; Neftegaz.ru, 2014; Frontera Resources, 2015).

Outlook

During the past decade, the Government of Georgia significantly improved the business climate in the country and continued positioning Georgia as a transit hub for hydrocarbons and other goods. The mineral sector, however, was unable to take full advantage of those changes. In the next 3 to 5 years, the mineral industry of Georgia is expected to have moderate but stable growth. Copper, ferroalloys, manganese, and steel are likely to remain the dominant mineral commodities in the short and medium terms. At the same time, a potential increase in domestic energy production could serve as a catalyst for faster future growth.

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TABLE 1
GEORGIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011[e]	2012[e]	2013[e]	2014[e]
METALS						
Copper, mine output, Cu content of concentrate		6,700	6,300	7,400	5,000	5,000
Gold	kilograms	5,000	7,000	3,900 [3]	4,300 [3]	2,600 [e]
Iron and steel:						
Ferroalloys, electric furnace:						
Ferromanganese		824	195	--	--	-- [3]
Silicomanganese		203,464	242,746 [3]	261,075 [3]	253,361 [r, 3]	256,677 [3]
Total		204,288	242,941 [3]	261,075 [3]	253,361 [r, 3]	256,677 [3]
Steel, rebar		200,000	200,000 [3]	220,132 [3]	188,737 [r, 3]	169,766 [3]
Manganese ore:[e]						
Gross weight		400,000	400,000	380,000	380,000	380,000
Mn content		116,000	116,000	110,000	110,000	110,000
Silver	kilograms	1,200	1,700	1,000	1,100	1,000
INDUSTRIAL MINERALS						
Cement		856,880	1,501,972 [r, 3]	1,545,546 [r, 3]	1,618,723 [r, 3]	1,626,198 [3]
Clays, bentonite[e]		5,000	4,800	4,900	5,000	5,000
Gypsum[e]		120	125	130	130	135
Nitrogen, N content of ammonia		150,000	145,000	150,000	150,000	160,000
Salt		30,000	28,000	29,000	30,000	28,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous		240,628 [3]	352,872 [r, 3]	421,755 [r, 3]	371,847 [r, 3]	293,955 [3]
Natural gas	thousand cubic meters	7,900	5,800 [r, 3]	5,400 [3]	5,400 [3]	10,000 [3]
Petroleum, crude:						
In gravimetric units		51,050	48,942 [r, 3]	44,061 [3]	56,995 [r, 3]	41,334 [3]
In volumetric units	42-gallon barrels	371,000	355,800 [r, 3]	320,000 [3]	414,400 [r, 3]	300,500 [3]

[e] Estimated; data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. -- Zero.

[1] Table includes data available through July 15, 2015.

[2] In addition to the commodities listed, Georgia may have produced arsenic, barite, diatomite, iron ore, lead, perlite, petroleum refinery products, zeolites, and zinc, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

TABLE 2
GEORGIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1]	Location or deposit names[1]	Annual capacity[e]
Arsenic:	Includes:	Of which:	2,000 [2]
As content of ore	Racha mining and chemical plant	Lukhumi Mine, Ambrolauri region	
	Tsana mining and chemical plant	Tsana Mine, Lentekhi region	
Metal and compounds	Racha mining and chemical plant	Racha region	
	Tsana mining and chemical plant	Tsana region	
Barite	NA	Chordskoye deposit, Onis Raioni	70,000
Do.	RMG Copper (Rich Metals Group)	Madneuli Mine	NA
Barite-zinc ore	NA	Kvaisi Mine	NA
Bentonite	Includes:	Of which:	200,000 [2]
	Askana LLC (Silver & Baryte Ores Mining Co., 97.7%)	Askanskoye Mine, Ozurget'i	
	NA	Gumbrskoye Mine, Gumbra region	
Cement	LLC Kartuli Cementi (LLC HeidelbergCement Caucasus Shared Services, 70%)	Rustavi	1,500,000
Do.	LLC Saq Cementi (LLC HeidelbergCement Caucasus Shared Services, 75%)	Kaspi and Rustavi	500,000

See footnotes at end of table.

TABLE 2—Continued
GEORGIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1]	Location or deposit names[1]	Annual capacity[e]
Coal	Saqnakhshiri Ltd.	Akhaltsikhe, Tkibuli-Shaorskoye, and Tkvarchelskoye deposits in Akhalts'ikhis Raioni, Tkibuli, and Tqvarch'eli regions	300,000 [2]
Copper-gold ore	RMG Copper (Rich Metals Group)	Sakdrisi deposit, Bolnisi region	12,000
Diatomite	NA	Kisatibskoye deposit, K'isat'ibi region	150,000
Ferroalloys:			
Ferromanganese	RMG Copper (Rich Metals Group)	Zestafoni ferroalloys plant, Zestap'onis Raioni	400,000
Silicomanganese	do.	do.	250,000
Manganese sinter	do.	do.	250,000
Gold	RMG Gold (Rich Metals Group)	Madneuli Mine	NA
Iron and steel, steel, rebar	Kutaisi metallurgical plant (OOO Eurasian Steel)	Kutaisi	100,000
Do.	Rustavi metallurgical plant (Georgian Steel Holding Group, 100%)	Rustavi	125,000
Do.	Geosteel LLC (JSW Steel Ltd., 51%, and Georgian Steel Holding Group, 49%)	do.	175,000
Do.	Moulds and Metals Georgia Ltd.	Poti	NA
Manganese ore	Chiaturamanganumi enterprise of Georgian Manganese Holding Limited LLC (Georgian American Alloys, Inc.)	Chiatura Mine	500,000
Nitrogen	JSC Azoti chemical plant (Agrochem S.A, 100%)	Rustavi	330,000
Petroleum:			
Crude	Saknavtobi Oil and Gas Co. and most Georgian petroleum companies in joint ventures with Frontera Resources, Ioris Valley Oil & Gas Ltd., Ninotsminda Oil Co. Ltd., Black Oil and Gas of United Kingsom, Anadarko Petroleum Corp. of Canada, Jindal Petroleum Ltd. of India, and GeoGeroil	About 60 wells that account for 98% of output in Mirzaani, Sup'sa, and Zemo T'elet'i regions	200,000 [2]
Do.	Canagro Ltd.	Sagarejo, eastern Georgia	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and names of locations.

[2] Capacity estimate is the total for all enterprises that could produce the commodity.

THE MINERAL INDUSTRY OF GERMANY

By Alberto Alexander Perez

In 2014, Germany was one of the leading industrial countries in the world, with a nominal gross domestic product (GDP) of $3.86 trillion[1] compared with $3.73 trillion (revised) in 2013, which was a 3.3% increase in terms of the nominal GDP and a 1.5% increase in terms of real GDP. The financial, rental, and business services sectors together produced 26% of Germany's GDP in 2014, whereas the manufacturing sector produced 22.2%, and the commerce, transportation, and catering sectors together produced 15.4%. The construction sector produced 4.8% of the GDP in 2014, and the information and communications sector produced 4.7%; the remainder was attributed to various other sectors.

Germany's GDP was ranked first in the European Union (EU) in 2014, and accounted for 21% of the total GDP of the EU. The United Kingdom was ranked second, with 16% of the EU's GDP; France, third (15%); and Italy, fourth (12%). In 2014, Germany produced 28.9% of the total GDP of all countries in the euro area. The inflation rate in Germany in 2014 was 0.8%, which was small compared with the rest of the EU and a decrease from the inflation rate of 1.6% in the previous year. Germany had an unemployment rate of 4.7% in 2014, which was an improvement from the 5.2% rate in 2013 (Federal Ministry for Economic Affairs and Energy, 2015, p. 59, 63; Germany Trade & Invest, 2015, p. 4).

In 2014, the public sector in Germany, including the Federal, Laender (State), municipal, and the social security systems in the country, as accounted for by the Federal Ministry of Finances, achieved a revenue budget surplus, which led to an overall budget surplus of 0.4%. The country also reduced its debt to 74% of its GDP in 2014 compared with 76.9% in 2013. The Government's goal was to achieve a debt ratio of less than 60% of the GDP within 10 years to comply with the long-term European Stability and Growth Pact. The Government also sought to reduce the country's debt to less than 70% of the GDP by 2017 (Federal Ministry for Economic Affairs and Energy, 2015, p. 31). Germany hosted about 55,000 foreign companies, which employed about 3 million people. Between 2010 and 2014, foreign direct investment (FDI) markets added a total of 4,142 investment projects from about 3,500 foreign companies, and in 2014, 800 projects were created, which ranked Germany fourth in the world in FDI projects. The principal countries that were sources of the new investment projects were the United States, with 21% of all investment projects; Switzerland, 11%; and the United Kingdom, 9%. Projects in the energy, minerals, and metals sectors accounted for 4% of all FDI projects in 2014; the principal sectors that received FDI investment were the information and communications technology, and software sectors, with 18%, and the business and financial services sector, with 15%. Sales, marketing, and support projects amounted to 42% of all FDI projects; business activity and business services, 15%; and manufacturing, 11% (Germany Trade & Invest, 2015, p. 3).

In 2014, Germany was a leading global exporter of industrial goods and services (including processed and fabricated mineral products). The country's mineral industry, however, depended heavily on imported mineral raw materials. Germany was the leading producer of lignite in the world, and essentially all the lignite consumed in the country was supplied by domestic production. Germany was dependent on imports of other mineral fuels for most of the remainder of its primary energy consumption. Germany's metal-processing sector relied on imports of metal ores and concentrates and reprocessing of metallic scrap and waste materials (both imported and produced domestically), because no metals were mined in sufficient amounts for metallurgical use in the country. Germany was also heavily reliant on imports of numerous industrial minerals and many refined metals. The international competitiveness of the country's nonfuel mineral-processing and fabrication sector relied primarily on such factors as a highly skilled labor force; research, development, and rapid assimilation of new technologies (including metal and other mineral materials recycling technologies); and the development and maintenance of liberal trade relationships both within and outside the EU. Germany's position in the global mineral economy was predominantly that of a major consumer and processor of minerals (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 5–44).

In 2014, Germany was estimated to have been the second-ranked producer of refined selenium in the world, the third-ranked producer of kaolin and refined lead, the fourth-ranked producer of salt, and the fifth-ranked producer of potash and bentonite (table 1; Anderson, 2016; Bolen, 2016; Flanagan, 2016; Jasinski, 2016).

Minerals in the National Economy

In 2014, the most valuable mineral commodities were those related to energy production. The value of marketed production of coal (lignite and bituminous), crude petroleum, natural and petroleum gas, and peat was a combined $17.94 billion in 2014. Germany's potash production was valued at $1.05 billion; lime, $739 million; rock salt, $732 million; and sulfur, $105 million. In terms of tonnage of output, sand and gravel was a significant mineral commodity [with a total production of 248 million metric tons (Mt)], as was natural broken stone and lignite. Lignite was the principal locally produced energy source in the country.

The processing and manufacture of such metals as lead, nickel, and steel were also important to Germany's economy, as were the processing and manufacture of industrial components and minerals, such as cement (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, 15–17).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an annual average exchange rate of about EUR0.7525=US$1.00 for 2014. All values are nominal, at current prices, unless otherwise stated.

Government Policies and Programs

Germany's main mining law is the Federal Mining Act (BGBl. IS. 1310), which was approved on August 13, 1980, and revised on December 9, 2006, through a slight revision to provisions of Article 11 (BGBl. IS. 2833). The country's production of some minerals (including anhydrite and gypsum, limestone and some other types of natural stone, peat, and some types of sand and gravel) was not directly regulated under the Federal Mining Act but was covered by a variety of other land-management and environmental regulations at both the Federal and State levels. Also, the establishment of the Federal Mines Inspectorate was not stipulated in the Federal Mining Act (although this inspectorate does enforce many of the regulations in the main mining law); the Federal Mines Inspectorate was established through Articles 83 and 84 of Germany's Constitution (Bundesministerium der Justiz, 2007, p. 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2013, p. 13–15; Bundesministerium für Wirtschaft und Technologie, 2013, p. 35–46).

The Environmental Impact Assessment Act (EIA Act) (BGBl. IS. 1757, 2797), which was approved on June 25, 2005, and revised through slight changes to Article 2 (BGBl. IS. 3316) of the act on December 21, 2006, was the environmental law that was most applicable to the mineral industry. This act incorporates provisions of an older ordinance concerning the assessment of environmental impacts for mining projects (BGBl. 1S. 1420), which was approved on July 13, 1990, and revised through slight changes to Article 8 (BGBl. IS. 2819) on December 9, 2006. The EIA Act also incorporates other older ordinances, such as one for the protection of groundwater against pollution caused by certain dangerous substances (BGBl. IS. 542), which was approved on March 18, 1997, and is applicable to the use and disposal of many of the chemicals used in mining and mineral-processing in Germany. The EIA Act requires environmental impact assessments for all domestic waste repositories created or used by the mineral industry. The Federal Mining Act stipulates how these repositories are to be constructed and operated (monitored) (Bundesministerium der Justiz, 2007, p. 30; Bundesanstalt für Geowissenschaften und Rohstoffe, 2013, p. 13–15; Bundesministerium für Wirtschaft und Technologie, 2013, p. 35–46).

Production

In 2014, the most salient increases in the production of metals were those of copper (smelter production), which increased by 13%; primary aluminum and secondary zinc metal, by 8% each; and refined lead, by 6%. Production of crude gallium decreased by 58%, and that of magnesium metal, by 6%.

The most salient increases in the production of industrial minerals were those of barite, which increased by 58%; bentonite, by 10%; construction sand, by 9%; silica sand, by 8%; and magnesium compounds, by 7%. Production of fluorspar decreased by 29%; all salt, by 23%; ceramic and refractory clays, and nitrogen, by 8% each; lime, quicklime, and dead-burned dolomite, by 7% each; and sulfur, by 6%.

The most salient increases in the production of mineral fuels and related materials were the production of uranium concentrate, which increased by 22%; residual fuel oil, by 16%; and coke, by 12%. Production of liquefied petroleum gas decreased by 12% in 2014; that of crude petroleum, naphtha, and petroleum coke, by 9% each; associated natural gas, by 8%; nonassociated natural gas, by 6%; and dry natural gas, by 5% (table 1).

Structure of the Mineral Industry

Table 2 lists the major mineral industry facilities in Germany in 2014. Since the closure of the last metal mines in 1992, no metallic ores (with enough metal content for metallurgical use) have been produced in Germany. Many of the leading companies in the global metal-processing sector owned and operated significant facilities in Germany in 2014. ThyssenKrupp AG (based in Duisburg, Germany) was the leading producer of crude steel in Germany and the 19th-ranked producer of crude steel in the world. Salzgitter AG (based in Salzgitter, Germany) was the second-ranked producer of crude steel in the country but was not among the top 40 producers of crude steel in the world. ArcelorMittal S.A. (based in Luxembourg) was the third-ranked producer of crude steel in Germany and the company itself, including production in plants located across the world, was the leading producer in the world. Aurubis AG was the leading producer of refined copper in Germany and the EU, and Salzgitter held a 25% ownership interest in Aurubis. Aurubis was the second-ranked producer of copper cathodes in the world and the leading producer of secondary refined copper. Glencore plc (based in Switzerland and registered in the United Kingdom) was the leading producer of zinc metal in Germany and the leading producer of mined zinc in the world. Norsk Hydro ASA of Norway was the second-ranked producer of aluminum in Germany and the fifth-ranked producer of primary aluminum in the world; the company owned the largest single primary aluminum smelter in Germany (the Rheinwerk primary smelter at Neuss). Berzelius Metall GmbH (based in Stolberg, Germany) was the leading producer of primary lead in the country.

The majority of the mining and quarrying enterprises that extracted building stone, sand and gravel, clay and kaolin, and ceramic raw materials were small enterprises. Fifty-three percent of the companies that produced sand and gravel had fewer than 10 employees, and 43% of the companies that produced crushed stone had 10 or fewer employees. This is possibly owing to the Government promotion of small enterprises and the considerable mechanization of the industry (table 2; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–45; Stahlinstitut VDEh and Wirtschaftsvereinigung Stahl, 2013, World Steel Association, 2015a, p. 10).

Mineral Trade

In 2014, Germany's imports of mineral fuels decreased to 230 Mt from about 248 Mt (revised) in 2013, whereas imports of metallic raw materials (including mineral ores and concentrates and other metallic raw materials, such as scrap metal), increased to 66.8 Mt from 63.4 Mt (revised) in 2013, and those of industrial mineral raw materials increased to 25.5 Mt from 24.8 Mt in 2013. In 2014, Germany imported 96.3 million cubic meters of natural gas, which was a decrease of 9.6% compared with that of the previous year; the principal countries from which Germany imported natural gas were Russia, the Netherlands, and Norway. Germany also imported 87.5 Mt of crude oil, most of which also came from Russia, the Netherlands, and Norway. Germany exported 2.6 Mt of lignite in 2014, of which 51% was exported to the Czech Republic and 16.7% was exported to Belgium (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

In 2014, Germany also imported 10,978 kilograms (kg) of enriched uranium, of which 45.3% was from France; 42.3%, from Russia; and the rest, from other countries. Germany exported 22,175 kg of enriched uranium, mostly to France (41.1%), the United States (28.3%), and the United Kingdom (16.6%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

Germany's imports of nonferrous metals in 2014 included 1.18 Mt of copper concentrate from Brazil (20.9%), Chile (20.2%), Argentina (19.5%), and Peru (17.8%), with the rest originating from other sources. Germany also imported 364,990 metric tons (t) of zinc concentrate from Australia (which supplied 49.6% of these imports), the United States (16.5%), Sweden (15.7%), and other sources (18.2%). Germany also exported 98,065 t of zinc concentrate to France (which received 57.4% of these exports), Belgium (25.2%), the Netherlands (16.8%), and others (0.6%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

In 2014, Germany imported 20,561 t of tin metal from Peru (which supplied 27.7% of these imports), Belgium (23.4%), Indonesia (20.5%), and other sources (28.4%). Germany imported 43 Mt of iron concentrate in 2014 from Brazil (which supplied 55.9%), Sweden (15.5%) and Canada (15.3%), and other sources (13.3%). Germany imported 20,214 t of crude steel from Italy (31.8%), the Netherlands (29%), Ukraine (15.1%), Austria (13%), and other sources (11.1%). Germany also exported 4,223 t of crude steel, mostly to France (16.6%), and the United States (12.8%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 80, 99–101).

Germany also exported industrial minerals, including 430,371 t of anhydride and gypsum, mostly to Switzerland (22%), the Netherlands (21.7%), Luxembourg (14.6%), and Belgium (11.2%); 580,436 t of industrial salt mostly to Belgium (31.4%), Poland (16.1%), and France (10%); and 790,066 t of quartz mostly to the Netherlands (64.1%), France (21.2%), and Luxembourg (11.4%) (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34, 99–101).

Commodity Review

Metals

Iron and Steel.—In 2014, Germany's demand for iron ore for pig iron production was satisfied exclusively through imports. Germany imported 43 Mt of iron ore in 2014, which was an increase of 6.5% from the previous year. More than one-half of the iron ore came from Brazil, and the rest came from Canada and Sweden (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–36).

Barbara Erzbergbau GmbH produced iron ore at the Porta Westfalica facility North Rhine-Westphalia and, in 2014, it produced 455,941 t. The iron content in the iron ore was very low, however—about 10.5%—and was not economically recoverable; therefore, the ore was used as aggregate in the construction industry (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–36).

In 2014, crude steel production increased by about 0.7% to about 42.9 Mt. Approximately two-thirds of this steel was made by the oxygen steelmaking process in integrated mills, and the rest was made in electric arc furnaces using steel scrap. Germany's steel industry revenues for 2014 were about $50.28 billion. Germany ranked seventh in world steel production in 2014, accounting for a total of 2.6% of all world production. Germany, which was the leading steel producer in the EU, produced about 26% of all the EU's steel and produced 44.8% of the EU's steel from secondary sources. The leading producers of steel in Germany were, in order of production amount, ThyssenKrupp AG (12.2 Mt), Salzgitter AG (7.4 Mt), ArcelorMittal Germany (7.3 Mt), HKM AG (5.1 Mt), Saarstahl AG (2.7 Mt), Dillinger Huttenwerke AG (2.3 Mt), Riva (2.3 Mt), and Badische Sathkwerke (1.9 Mt) (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 35–36).

Molybdenum.—To meet its national demand, Germany imported 4,354 t of concentrates of molybdenum from, in order of amount supplied, the United Kingdom, Belgium, and the Netherlands. H.C. Stark AG processed molybdenum-containing residues from the metalworking and chemical industries and converted them into ferromolybdenum. Germany was a leading consumer of molybdenum in the world after China, the United States, and Japan (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 37).

Tungsten.—Germany's demand for tungsten, with the exception of secondary recovery from scrap, was mostly fulfilled with imports. In 2014, Germany imported 357 t of ore, and most of these imports originated from Bolivia, Brazil, and Mongolia. Germany also imported 57 t of tungsten metal and 1,342 t of ferrotungsten, mostly from China and Vietnam.

H.C. Stark processed specialized tungsten semifinished products and tungsten powder chemicals; it employed 1,630 workers in Germany. It had partnerships with Jiangxi Rare-Earth and Rare Metal Tungsten group (JXTC) of China in two joint ventures in Ganzhou Province, China (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 37–38).

Industrial Minerals

Clay and Shale.—The leading region for kaolin production in Germany was Bavaria, which has deposits in the upper Palatinate; other significant kaolin deposits are located in, in order of resources, Saxony, Hesse, Rhineland-Palatinate, Saxony-Anhalt, and North Rhine-Westphalia. In 2014, Germany produced 4.28 Mt of kaolin, which was a slight decrease from the 4.29 Mt produced in the previous year. Germany was the principal producer of kaolin in the EU and the third-ranked producer in the world (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 45).

Potash.—In 2014, the K+S Group had six mines from which it extracted potash and magnesium and with which the company produced fertilizers. The K+S Group also produced a range of potash- and magnesium-based products for industrial applications, which made the company a leading potash and magnesium producer in the world. In 2014, the turnover for the K+S Kali GmbH Co.'s (a subsidiary of K+S Group) range of potash and magnesium products decreased by 7.5% to $2.5 billion on 2014 from $2.7 billion in 2013. The company produced 3 Mt of marketable potash (K_2O content) in 2014. The company was considering an expansion at its Lower Saxony plant in the medium term, while it also sought to reopen the Siegfried-Giesen Mine situated between Hannover and Hildesheim that had been decommissioned since 1987. The company planned to construct a new potash-processing plant and expected to file the required application documents to the authorities of Lower-Saxony in February 2015. K+S Kali GmbH was the leading producer of potash in Europe and the fifth-ranked potash producer in the world (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 44).

Salt.—In 2014, Germany was the leading producer of salt in the EU, with total salt production of about 13.3 Mt, of which 2.8 Mt was exported. Salt mining in Germany was done by mining and in saline plants located in Baden-Wuerttemberg, Bavaria, Hesse, Lower Saxony, North Rhine-Westphalia, Saxony-Anhalt, and Thuringia. Rock salt production in 2014 was about 5.4 Mt, which was a decrease of about 40% compared with the production of about 9 Mt in 2013. Industrial brines, evaporated salt, and brine for balneotherapy were produced at five mines and in six saltwork sites. European Salt Co. (ESCO), a subsidiary of K+S Aktiengesellschaft, was a leading supplier of rock and evaporated salt in the EU. The company had mines in Bernburg, Borth, and Grasleben. Wacker Chemie AG operated a salt mine at Stetten, and the company employed 70 people. Saline Luisenhall GmbH obtained brine from a saline deposit at Gottingen, and the salt production company of Westphalia [Salzgewinnungsgesellschaft Westfalen (SGW), which was a 65% subsidiary of the Solvay Group of France] extracted brine in the region of Gronau-Epe. Dow Chemical Co. of the United States owned the salt domes at Ohrensen and Teutschenthal from which it extracted brine (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 44).

Mineral Fuels and Related Materials

Coal.—In 2014, the Government's program to eliminate the anthracite subsidy by the end of 2018 continued. By the end of the year, RAG Deutsche Steinkohle AG still had three mines, with two in the Ruhr and one in Ibbenburen. Germany's anthracite coal industry had decreased its production to 7.6 Mt in 2014 from 36.8 Mt in 2000, and exports of coal decreased by 0.04 Mt to 0.14 Mt in 2014. The industry simultaneously reduced personnel to 21,104 workers in 2014 from 58,100 workers in 2000. The total domestic sales of anthracite coal in Germany in 2014 were 8.12 Mt, or 32,000 t less than in 2013; the leading consumers were German powerplants, which consumed 2.2% more than in the previous year. The German steel industry consumed 52,000 t, or 42.9% less coal than in the previous year, and in the domestic heating market, 21,000 t of coal was sold, which was about the same amount as in the previous year.

The production of lignite in Germany in 2014 was about 178.2 Mt, which was a decrease from the 183 Mt produced in the previous year. The development of the industry varied according to the district in which it was exploited. The Rheinish mining area produced 93.6 Mt of lignite in 2014, which was a decrease of 5.1% compared with the previous year, and in the Lausitz region, 61.8 Mt was extracted. This production was 2.8% lower than that of the previous year. In the central region of Germany, 20.9 Mt of lignite was produced, which was an increase of 6.9% compared with that of the previous year, and in the Helnsteder area, lignite production increased by 51.5% to 1.8 Mt in 2014.

In 2014, 159.1 Mt of lignite, which represented 89% of all lignite production in the country, was sold to powerplants for the production of domestically consumed electricity and heat. Lignite also was used to produce briquets, pulverized fuel, bed coal fluid, and coke, and for this production, about 19.1 Mt of lignite was used in 2014. Germany produced 1.7 Mt of briquets in 2014 and 4.4 Mt of lignite dust, which was an increase of 12.4% and 2.4%, respectively, from that of 2013 (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015a, p. 8, 32–34; Bundesministerium für Wirtschaft und Energie, 2015, p. 9–12).

Uranium.—Uranium had not been mined in Germany since 1990, when the Soviet-German corporation WISMUT closed; however, uranium was produced as part of the flood-water purification and remediation procedures at the mine site near Konigstein, from which 33 t was recovered in 2014 and 27 t was recovered in 2013. The decommissioning and remediation work at the former SDAG WISMUT site had been ongoing for the past 24 years (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34).

A central tenet of the energy transition plan of the German Government is to eliminate nuclear energy for commercial power generation by decomissioning all nuclear powerplants by 2022. As of 2014, Germany still had nine active nuclear powerplants: Grafenrheinfeld, which was scheduled to close in 2015; Gundremmingen B, scheduled to close in 2017; Phillipsburg 2, scheduled to close in 2019; Brokdorf, Grohnde, and Gundremmingen C, all scheduled to close in 2021; and Emsland, Isar 2, and Neckarwestheim, scheduled to close in 2022 (Bundesanstalt für Geowissenschaften und Rohstoffe, 2015, p. 34).

Outlook

In 2014, Germany's economy was growing and unemployment was decreasing. Production within the mineral sector was stable, registering increases that were mostly in response to commodity demand. Germany had several energy challenges that it will have to face in the long term, and which are dictated by Government policy, including the elimination of nuclear power as a source of primary energy and the elimination of subsidies for the coal industry. In order to eliminate nuclear power gradually from Germany's energy mix by 2022 and still be on track to reduce greenhouse gas emissions by 80%

in 2050 (compared with the level of emissions in 2010), the Government projects that about 38% of the electricity generated in the country in 2030 will have to come from renewable energy resources; 23%, from lignite; about 20%, from natural gas; and about 4%, from heating oil, pumped storage, and other sources. Concurrently, in 2030, the country's entire supply of hard coal would have to be imported if the elimination of the hard coal subsidy results in zero production. The indirect implications for the mineral industry of increased consumption of renewable energy resources could include increased consumption of minerals used in the manufacture of wind turbines (including rare earths), in solar cells (including silicon and silver), and in other renewable energy technologies (Gesamtverbands Steinkohle e.V., 2011, p. 22–26; AG Energiebilanzen e.V., 2013, p. 25–27; Bundesministerium für Wirtschaft und Technologie, 2013, p. 5, 8, 16–18, 38, 49–51).

Germany's production of potash is likely to increase as world demand increases. New projects and the expansion of existing facilities would accommodate future increases in production as demand increases. Levels of production of fertilizer materials in Germany, however, are expected to vary with fluctuations in demand outside of Europe. Expected increases in the global population and in the level of prosperity in emerging market economies, including those of Latin America and Southeast Asia, are likely to increase food consumption and, thus, the intensity of land cultivation. Also, expected increases in meat consumption will likely increase the need for animal feed and, therefore, further increase demand for most of Germany's fertilizer products.

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TABLE 1

GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Alumina		973	950 [e]	967	1,000 [e]	1,000 [e]
Aluminum hydroxide, Al_2O_3 equivalent		1,485	1,405	1,364	1,360 [e]	1,300 [e]
Metal:						
Primary		402	432	410	492	531
Secondary		611	634	635	597	599
Total[2]		1,014	1,067	1,045	1,089	1,130
Cadmium, metal, refinery[e]	metric tons	290	300	300	300	NA
Cobalt, matte, including shavings and scrap	do.	829	671	497	500 [e]	NA
Copper, metal:						
Smelter:						
Primary		379	346	352	295	351
Secondary		212	218	182	169	173
Total[2]		591	564	534	464	524
Refined:						
Primary		402	401	390	390 [r]	392
Secondary		302	308	296	288	285
Total[2]		704	709	686	678	677
Gallium, crude[e]	metric tons	30	30	30	38	16
Gold, metal, refined, including secondary	kilograms	44,100 [e]	50,682	53,476	53,000 [e]	53,000 [e]
Indium, refined[e]	metric tons	10	10	10	NA	NA
Iron and steel:						
Ore, run of mine:[3]						
Gross weight		390	489	448	413	456
Fe content		41	51	47	43	48
Metal:						
Pig iron		28,560	27,943	27,046	27,177	27,943
Direct-reduced iron		450	380	560	560 [e]	560
Ferroalloys:						
Ferrochromium[e]	metric tons	18,300	18,500	17,800	17,800	17,800
Other	do.	9,200 [e]	9,985	8,248	8,200 [e]	8,200
Steel, crude		43,830	44,284	42,661	42,645 [r]	42,941
Semimanufactures		36,827	37,933	36,495	36,500 [e]	36,500
Lead, metal, refined:						
Primary		125	136	134 [e]	151	160
Secondary		279	293	290 [e]	249	248
Total		404	429	424 [e]	400	408
Magnesium, metal including castings		15	15	16	16	15
Platinum-group metals, metal, refined	metric tons	100 [e]	50	54	54 [e]	54
Selenium, contained metal[e]	do.	650	700	650	650	650
Silicon, metal	do.	30,105	30,134	29,000 [e]	28,000	28,000
Silver, metal, refined, including secondary	do.	1,768	1,886	1,753	1,750 [e]	1,750
Tin, alloys[e]	do.	7,000	6,000	7,000	7,000	7,000
Zinc, metal:						
Primary		144	142	139 [e]	162 [r]	165
Secondary		21	28	30 [e]	26	28
Total		165	170	169 [e]	188	193
INDUSTRIAL MINERALS						
Abrasives, manufactured:						
Corundum		83	90	83	80	76
Fused aluminum oxide, crude[e]		20	20	20	NA	NA
Silicon carbide[e]		20	20	20	NA	NA
Aluminum salt slag, Al_2O_3 equivalent[e]		200	200	200	NA	NA

See footnotes at end of table.

TABLE 1—Continued
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity	2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued					
Barite, marketable (contained $BaSO_4$)	56	55	52	45	71
Boron compounds, manufactured, including boric acid and oxide	163	157	149	143	139
Bromine compounds, including oxide[e] metric tons	1,500	1,600	1,600	NA	NA
Cement and clinker:					
Clinker, intended for market	22,996	24,775	24,581	23,127 [r]	23,871
Hydraulic	29,203	32,779	32,432	31,308	32,099
Chalk, natural, including ground[e]	1,350	1,400	1,450	NA	1,740
Clays, natural:					
Bentonite	363	375	366	359	395
Ceramic and refractory clays	3,978	4,027	4,045	4,183	3,863
Of which, fire clay and chamotte	246	253	270	270 [e]	NA
Kaolin, marketable	4,560	4,899	4,399	4,290	4,275
Other, unspecified	198	200 [e]	172	140	54
Dolomite, neither burnt nor sintered	792	622	504	500 [e]	NA
Feldspar, all uses[4]	5,203	5,483	5,321	5,300 [e]	5,300
Of which, feldspar for industrial uses[e]	203	218	205	200	200
Fluorspar, acid-grade	59	66	54	49	35
Gypsum and anhydrite:					
Natural	1,822	2,021	1,949	1,778	1,802
Byproduct of flue-gas desulfurization[e]	6,320	6,780	7,010	7,100	NA
Lime, quicklime, dead-burned dolomite	6,856	7,113	6,575	6,883	6,390
Magnesium compounds, byproduct of potash mining	1,310	1,348	1,372	1,365	1,455
Mullite, synthetic[e]	15	15	15	NA	NA
Nitrogen, N content of ammonia	2,677	2,821	2,823	2,757	2,540
Peat, horticultural use thousand cubic meters	7,759	7,911	8,205	8,200 [e]	8,200
Phosphoric acid, manufactured, P_2O_5 content	21	20	12	14	24
Pigments, iron oxide (including synthetic iron oxide)	234	223	204	200 [e]	200
Potash, K_2O content:					
Crude	3,630	3,827	3,767	3,675	3,738
Marketable	3,024	3,215	3,149	3,075	3,127
Salt, NaCl content, marketable:					
Evaporated salt, including marine salt	322	329	301	297	274
Industrial brines	8,752	8,066	7,515	8,073	7,709
Rock salt and other brines	10,602	9,048	6,840	9,026	5,355
Total[2]	19,676	17,442	14,656	17,396	13,338
Siliceous earth, marketable	49	53	50	50 [e]	50 [e]
Soda ash (Na_2CO_3), manufactured	2,539	2,668	2,627	2,548	2,558
Stone, sand and gravel:					
Stone, crude:					
Dimension, including partially worked	425	467	477	505	495
Of which, marble and other calcareous stone	287	314	356	350 [e]	350
Crushed, not including chalk	149,463	164,487	154,020	154,000 [e]	154,000
Dolomite and limestone, not for cement manufacture	18,000	18,400	17,600	18,800	19,000
Gravel, natural:					
Construction gravel	67,822	76,191	72,615	72,105	71,811
Crude, including flint and pebbles	9,693	11,043	9,639	9,600 [e]	9,600
Other gravel, including quartzite	NA	NA	NA	NA	NA
Sand, natural:					
Construction sand	63,962	72,394	67,852	66,039	71,841
Silica sand, including glass sand and quartz sand	7,234	7,770	7,498	7,248	7,836
Other, including from granite and pegmatite	NA	NA	NA	NA	NA
Total, sand and gravel	148,711	167,398	157,604	154,992	161,088
Strontium carbonate, manufactured[e]	120	130	120	120	120

See footnotes at end of table.

TABLE 1—Continued
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued						
Sulfur:						
Marketable		832	875	798	755	708
Byproduct:						
Metallurgy		2,266	2,394	2,373	2,400[e]	2,400
Natural gas and petroleum		1,447	1,514	1,445	1,400[e]	1,400
Total		3,713	3,908	3,818	3,800[e]	3,800
MINERAL FUELS AND RELATED MATERIALS						
Carbon black		684	908	923	920[e]	NA
Coal:						
Anthracite and bituminous, marketable		12,900	12,059	11,558	8,260	8,340
Lignite		169,403	176,502	185,432	182,696	178,178
Coke:						
Of anthracite and bituminous coal		8,241	7,990	8,050	8,379[r]	8,770
Of lignite		176	171	170	161	175
Fuel briquets of lignite		2,024	2,136	1,910	1,951	1,709
Gas:						
Manufactured:						
Blast furnace[e]	million cubic meters	9	9	9	9	NA
Coke oven	do.	951	922[e]	929[e]	920[e]	NA
Total[e]	do.	960	931	938	929	NA
Natural:						
Associated (byproduct of crude petroleum)	do.	81	80	78	73	67
Gross (nonassociated)	do.	13,584	12,873	11,706	10,751[r]	10,127
Marketable (dry or net)	do.	12,571	11,799	10,660	9,693	9,193
Petroleum:[5]						
Crude	thousand 42-gallon barrels	18,400	19,600	19,200	19,387	17,737
Refinery products:						
Liquefied petroleum gas	do.	33,180	32,860	33,010	33,280	29,200
Distillate fuel oil	do.	340,000	330,000	345,100	338,200	332,000
Residual fuel oil	do.	41,600	42,400	44,200	39,290	45,400
Gasoline, including aviation	do.	180,000	180,000	173,000	168,300	164,400
Kerosene and jet fuel	do.	37,400	38,100	40,700	37,100	37,900
Naphtha	do.	72,000	70,000	70,000	67,400	61,200
Refinery gas	do.	44,500	45,100	44,000	43,600	42,290
Bitumen, bituminous mixtures, and other residues	do.	32,800	34,600	33,000	32,000	32,400
Lubricants and miscellaneous oils	do.	18,000	17,000	17,000	17,000	17,000
Petroleum coke	do.	11,500	10,100	9,970	10,620	9,720
Mineral jelly, waxes, and paraffins	do.	900	900	1,000	990	1,210
Other	do.	8,630	6,590	8,330	8,000	8,000
Total[e]	do.	821,000	808,000	811,000	796,000	781,000
Uranium concentrate, U_3O_8 content		9	60	52	27	33

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available.

[1] Table includes data available through February 17, 2016.

[2] Data may not add to totals shown.

[3] Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to be used in the steel industry.

[4] All uses include use as gravel for road construction, and industrial uses include uses in the manufacturing of ceramics.

[5] All figures through 2012 were converted to barrels from those reported in metric tons according to data from Mineralölwirtschaftsverband e.V., 2013, Jahresbericht—Mineralöl-Zahlen, 2012: Berlin, Germany, Mineralölwirtschaftsverband e.V., July, p. 48 and 79, and reflect the significant digits of the conversion factors.

TABLE 2
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Abrasives (silicon carbide)	ESK-SiC GmbH	Plant at Grefrath, Frechen	36
Alumina	Almatis GmbH (Dubai International Capital LLC)	Plant at Ludwigshafen	NA
Do.	Nabaltec AG	Plant at Schwandorf	120
Do.	Aluminium Oxid Stade GmbH (DADCO Alumina & Chemicals Ltd., 100%)	Plant at Stade	1,050
Do.	Martinswerk GmbH (Albemarle Corp., 100%)	Plant at Bergheim	350
Do.	Alufin GmbH Tabularoxide (Alteo Holdings, 100%)	Plant at Teutschenthal	17
Alumina, fused	Treibacher Schleifmittel GmbH (Imerys S.A., 100%)	Plant at Zschornewitz	NA
Aluminum	Hydro Aluminium Deutschland GmbH (Norsk Hydro ASA, 100%)	Rheinwerk primary smelter at Neuss	235
Do.	Metallhüttenwerke Bruch GmbH	Secondary foundry alloy plant at Dortmund; secondary cast alloy plants at Asperg and Bad Saeckingen	110
Do.	Aleris Recycling (German Works) GmbH (Aleris Corp., 100%)	Secondary smelters: Erftwerk at Grevenbroich, Innwerk at Toeging am Inn, and Neckarwerk at Deizisau	320
Do.	TRIMET Aluminium AG	Primary smelter at Essen-Borbeck	175[e]
Do.	do.	Recycling plant and secondary smelter at Gelsenkirchen	160[e]
Do.	do.	Recycling plant and secondary smelter at Harzgerode	40
Do.	Hamburger Aluminium-Werke GmbH (TRIMET Aluminium AG, 100%)	Primary smelter at Hamburg	133
Do.	Aluminiumwerk Voerde Aluminium GmbH (Klesch & Company Ltd., 100%)	Primary smelter at Voerde, North Rhine-Westphalia	130
Aluminum, hot-rolled products	Aluminium Norf GmbH [Novelis Inc. (Hindalco Industries Ltd., 100%), 50%, and Hydro Aluminium Deutschland GmbH, 50%]	Lippenwerk at Luenen (secondary) and rolling mill at Neuss	1,500
Aluminum salt slag	Befesa medio ambiente S.A.	Plants at Hannover, Luenen, and Toeging	380
Do.	K+S Entsorgung GmbH (K+S Aktiengesellschaft, 100%)	REKAL plant at Wanstorf	100
Arsenic, metal metric tons	PPM Pure Metals GmbH[2] (Recylex S.A., 100%)	Plant at Langelsheim	5
Do. do.	Reinstmetalle Osterwieck GmbH (PPM Pure Metals GmbH,[2] 100%)	Plant at Osterwieck	NA
Barite	Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach, and Dreislar Mine at Medebach-Dreislar	87
Do.	Deutsche Baryt-Industrie Dr. Rudolf Alberti GmbH & Co. KG (Sachtleben Bergbau GmbH, 75%, and other private, 25%)	Wolkenhügel Mine in the Harz Mountains and plant at Bad Lauterberg	50
Bentonite	Süd-Chemie AG (Clariant International Ltd., 100%)	Mining near Gammelsdorf, Bavaria, and plants at Duisburg, Heufeld, and Moosburg	500
Do.	S&B Industrial Minerals GmbH (S&B Industrial Minerals S.A., 100%)	Mining in region between Landshut and Mainburg, Bavaria	400
Do.	do.	Stollberg plant at Oberhausen	200[e]
Do.	do.	Plant at Neuss	50
Do.	Kärlicher Ton- und Schamotte-Werke Mannheim & Co. KG (KTS)	Quarry at Muelheim-Kaerlich	50
Cadmium, metal:			
Primary (byproduct)	Metaleurop Zinkbetrieb GmbH & Co. KG (Glencore plc, 100%)	Nordenham smelter, near Bremerhaven	160
Secondary	Accurec Recycling GmbH (I-met GmbH, 100%)	Battery recycling plant at Mülheim an der Ruhr	NA
Calcium carbonate, natural, ground	Alpha Calcit Fullstoff GmbH & Co. KG	Plant at Cologne	250
Do.	Omya GmbH (Omya AG, 100%)	Plants at Emden	2,250
Do.	Omya Weil GmbH (Omya AG, 100%)	Plant at Weil am Rhein	NA
Do.	Eduard Merkle GmbH & Co. KG (Omya AG, 100%)	Plant at Blaubeuren-Altental	NA

See footnotes at end of table.

TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Calcium carbonate, natural, including chalk	Vereinigte Kreidewerke Dammann KG (Omya AG, 100%)	Plants at Laegerdorf and Soehlde	500
Do.	Kreidewerk Rügen GmbH (Omya AG, 100%)	Quarries and plant at Sassnitz, on Ruegen Island	NA
Carbon black	Orion Engineered Carbons GmbH (Rhône Capital LLC, 50%, and Triton Advisors Ltd., 50%)	Kalscheuren plant at Cologne, and plant at Dortmund	NA
Cement	HeidelbergCement AG	Plant at Burglengenfeld; two plants at Ennigerloh; two plants at Geseke; plants at Koenigs Wusterhausen, Leimen, Paderborn, Mainz-Weisenau, and Schelklingen; the Lengfurt plant at Triefenstein; plant at Wetzlar	12,700
Do.	Dyckerhoff AG (Buzzi Unicem SpA, 88.37%, and other private, 11.63%)	Plants at Deuna, Geseke, Goellheim, Lengerich, Neuss, Neuwied, and the Amöneburg plant at Wiesbaden	7,200
Do.	SCHWENK Zement KG	Plants at Allmendingen, Bernburg, Heidenheim-Mergelstetten, and Karlstadt	6,900
Do.	CEMEX Deutschland AG (CEMEX S.A. de C.V., 100%)	Two plants at Beckum; plants at Dortmund, Duisburg, Eisenhuettenstadt, and Ruedersdorf	5,300
Do.	Holcim (Deutschland) AG (Holcim Ltd., 88.9%, and other private, 11.1%)	HANSA plant at Bremen, plants at Laegerdorf and Rostock, and the Höver plant at Sehnde	3,600
Do.	Lafarge Zement GmbH (Lafarge S.A., 100%)	Plants at Kall-Soetenich, Karsdorf, and Walzbachtal	3,400
Do.	Holcim (Baden-Württemberg) AG (Holcim Ltd., 100%)	Plant at Dotternhausen	1,600
Do.	TEUTONIA Zementwerk AG (HeidelbergCement AG, 94.2%, and other private, 5.8%)	Plant at Hannover	900
Do.	Märker Zement GmbH	Plants at Harburg and Lauffen	NA
Clays, including ball, ceramic, kaolinitic, and refractory clays	Sibelco Deutschland GmbH (S.C.R.- Sibelco NV, 100%)	25 quarries and 8 plants, including 2 at Ransbach and the Kannenbäckerland plant in Hoehr-Grenzhausen, Westerwald region; also including quarries and plants of Kaolin- und Tonwerke Seilitz-Loethain, Saxony region	2,000
Do.	Stephan Schmidt KG	Tonbergbau Grube Anton open pit mine, Dornburg-Langendernbach, Müllenbach and Thewald Mines, Hoehr-Grenzhausen; Wiesa-Thonberg and Cunnersdorf quarries, Kamenz-Wiesa, Westerwald	1,600
Do.	Marx Bergbau GmbH & Co. KG (Stephan Schmidt KG, 100%)	Lämmersbach and Meudt Mines, Ruppach-Goldhausen quarry, Dornburg-Langendernbach, Westerwald	350
Do.	Goerg & Schneider GmbH & Co. KG	Quarry and main plant at Boden, others at Mogendorf, Goddert, Siershahn, Wirges/Staudt, and Kettenbach/Taunus, Westerwald region; others in Saxony and Eifel regions	NA
Do.	Mittelhessische Tonbergbau GmbH (Goerg & Schneider GmbH & Co. KG, 50%, and Stephan Schmidt KG, 50%)	Quarry and plant in the Giessen/Lahn region	100
Do.	Rohstoffgesellschaft GmbH Ponholz	Mine and chamotte plant at Maxhuette-Haidoff, and Aufofweiher Mine, Bavaria	150
Do.	Adolf Gottfried Tonwerke GmbH	Quarries and plant near Grossheirath, Coburg, Bavaria	100
Do.	Erbsloh Lohrheim GmbH (Erbsloh family, 100%)	Mine at Lohrheim, Rheinland-Pfalz	30
Coal, anthracite and bituminous	Deutsche Steinkohle AG (RAG Aktiengesellschaft, 100%)	Augusta Victoria/Blumenthal, Prosper-Haniel, and West Mines, Ruhr region, North Rhine-Westphalia	11,000[e]
Do.	do.	Ibbenbüren Mine, Steinfurt District, North Rhine-Westphalia	2,100
Coke	ThyssenKrupp Steel AG	Schwelgern plant at Duisburg	2,100

See footnotes at end of table

TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Coke—Continued		ArcelorMittal Bremen GmbH (ArcelorMittal, 100%)	Coking plant at the Prosper-Haniel Mine	2,000 [e]
Do.		Hüttenwerke Krupp Mannesmann GmbH (ThyssenKrupp Steel AG, 50%; Salzgitter AG, 30%; Vallourec & Mannesmann Tubes SA, 20%)	Plant at Duisberg-Huckingen steel complex	1,100
Copper, refined		Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	500 [e]
Do.		Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luenen	210 [e]
Dolomite		Rheinkalk Hagen-Halden GmbH & Co KG (Lhoist NV, 100%)	Steinbruch-Donnerkuhle quarry and Hönnetal plant at Menden, and plant at Hagen-Halden	7,500
Dolomite and lime		Geomin Erzgebirgische Kalkwerke GmbH	Underground mines at Hermsdorf and Lengenfeld	NA
Feldspar		Saarfeldspatwerke H. Huppert GmbH & Co. KG	Mine at Oberthal, Gudesweiler, Saarland	60
Do.		Gottfried Feldspat GmbH	Mine at Freihung-Thansuss, Weiden, Bavaria	15
Ferrochrome		Elektrowerk Weisweiler GmbH (Kermas Ltd., 100%)	Plant at Eschweiler-Weisweiler, near Aachen	30
Fluorspar		Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach	55 [e]
Gallium	metric tons	Ingal Stade GmbH (5N Plus Inc., 50%, and Molycorp Inc., 50%)	Ingal plant at Stade	35
Do.	do.	PPM Pure Metals GmbH[2] (Recylex S.A., 100%)	Plant at Langelsheim	NA
Gold, metal		Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	NA
Do.	metric tons	Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luenen	40 [e]
Do.		Heraeus Precious Metals GmbH & Co. KG	Primary smelter and refinery and secondary plant at Hanau	NA
Do.		Umicore AG & Co. KG (Umicore S.A., 100%)	Plant at Hanau	NA
Do.		Allgemeine Gold- und Silberscheideanstalt AG (Umicore S.A., 91.21%, and other, 8.79%)	Plant at Pforzheim	NA
Graphite, manufactured		GK Graphit Kropfmühl GmbH (Advanced Metallurgical Group N.V., 100%)	Plant at Kropfmuehl, Passau	20
Do.		do.	Plants at Bad Godesberg and Wedel, Holstein	8
Gypsum		VG-ORTH GmbH & Co. KG	Mine and plant at Stadtoldendorf, and plants at Osterode, Spremberg, and Witzenhausen	150
Do.		Gyproc GmbH (Etex Group S.A., 80%, and Lafarge S.A., 20%)	Mines and plant in Lower Saxony	110
Do.		Knauf Gips KG	Mines and plant at Iphofen	NA
Iron, blast furnace		ThyssenKrupp Steel AG	Two blast furnace plants at Hamborn and Schwelgern	12,000
Iron, direct-reduced		ArcelorMittal Hamburg GmbH (ArcelorMittal, 100%)	Plant at Hamburg	600 [e]
Iron oxide, pigments		Lanxess AG	Plant at Krefeld-Uerdingen	300
Kaolin, feldspar, and quartz		Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerke GmbH, 100%)	Mines at Caminau, Hirschau, Kemmlitz, and Schnaittenbach, Bavaria	350
Do.		Gebrüder Dorfner GmbH & Co Kaolin- und Kristallquartzsand Werk KG	Mine near Hirschau, Bavaria	NA
Lead, metal		Weser Metall GmbH (Recylex S.A., 100%)	Primary and secondary smelter and refinery at Nordenham	145
Do.		Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Secondary smelters at Braubach am Rhein and Freiberg/Sachsen	200
Do.		do.	Primary smelter at Stolberg	160 [e]
Do.		Johnson Controls Recycling GmbH (Johnson Controls Inc., 100%)	Battery recycling plant and secondary smelter at Krautscheid	120
Do.		Muldenhütten Recycling- und Umwelttechnik GmbH	Secondary smelter at Freiburg, Saxony	55
Do.		Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Refinery at Hamburg	50
Lead, oxide, Pb content		Weser Metall GmbH (Recylex S.A., 100%)	Primary and secondary smelter and refinery at Nordenham	20
Lignite		RWE Power AG (RWE Aktiengesellschaft, 100%)	Open pit mines in Rheinish mining area: Bergheim, Garzweiler, Inden, and Hambach	105,000

See footnotes at end of table.

TABLE 2—Continued

GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Lignite—Continued	Vattenfall Europe Mining AG	Jänschwalde-Cottbus-Nord, Nochten, and Welzow-Süd Mines, Lausatian mining area	60,000
Do.	Mitteldeutsche Braunkohlengesellschaft AG	Profen and Vereinigtes Schleenhain mines	25,000
Limestone	Harz-Kalk GmbH	Quarry at Ruebeland	2,000 [e]
Do.	Kalkwerk Bad Kösen GmbH	Quarry at Bad Koesen	2,000 [e]
Do.	Fels-Werke GmbH	Quarry at Kaltes Tal	2,000 [e]
Do.	Schäfer Kalk GmbH & Co KG	Plants at Hahnstaetten, Steeden, Stromberg, and Grevenbrueck	3,000
Do.	Rheinkalk GmbH & Co KG (Lhoist NV, 100%)	Flandersbach quarry and plant at Wuelfrath, and lime plant at Menden-Hoennetal	7,500
Magnesium, metal, secondary	Norsk Hydro Magnesiumgesellschaft GmbH (Norsk Hydro ASA, 100%)	Plant at Bottrop	26
Do.	Aleris Recycling (German Works) GmbH (Aleris International Inc., 100%)	Plant at Toeging am Inn	15
Mullite, fused	Imerys Fused Minerals Zschornewitz GmbH (Imerys S.A., 100%)	Plant at Zschornewitz	31
Mullite, sintered	Nabaltec AG	Plant at Schwandorf	10
Natural gas million cubic meters	Mobil Erdgas-Erdöl GmbH (Exxon Mobil Corp., 100%), including any fields owned or operated by BEB Erdgas und Erdöl GmbH (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Goldenstedt, Hemmelte, Klosterseelte, Söhlingen, and other fields in Lower Saxony	14,000 [e]
Do. do.	RWE-Dea AG (RWE Power AG, 100%)	Bötersen, Hemsbünde, Völkersen, and smaller fields in Lower Saxony; Inzenham-West Field, Bavaria	3,000 [e]
Do. do.	Gaz de France Produktion Exploration Deutschland GmbH (Gaz de France S.A., 100%)	Salzwedel Field, Saxony-Anhalt; Schneeren and smaller fields in Lower Saxony	1,500 [e]
Do. do.	Wintershall Holding AG (BASF AG, 100%)	A6/B4 Blocks offshore Schleswig Holstein; smaller fields in Lower Saxony	1,200 [e]
Do. do.	EEG-Erdgas Erdöl GmbH (GDF Suez S.A., 100%)	Muehlhausen and other fields in Thüringen	50 [e]
Petroleum:			
Crude thousand 42-gallon barrels	Wintershall Holding AG (BASF AG, 100%), 50%, and RWE-Dea AG (RWE Power AG, 100%), 50%	Mittelplate-Dieksand field in tidal flats of the North Sea offshore Schleswig-Holstein	15,500
Do. do.	Wintershall Holding AG (BASF AG, 100%)	A6/B4 Blocks offshore Schleswig Holstein; Aitingen field, Bavaria; Emlichheim field, Lower Saxony; and smaller fields in Lower Saxony and Rheinland-Pfalz	2,000 [e]
Do. do.	Gaz de France Produktion Exploration Deutschland GmbH (GDF Suez S.A., 100%)	Bramberge, Ruehlertwist, Scheerhorn, and Ringe fields in Lower Saxony; smaller fields in the States of Bavaria, Hamburg, Lower Saxony, and Mecklenburg-Western Pomerania	3,500 [e]
Do. do.	Mobil Erdgas-Erdöl GmbH (Exxon Mobil Corp., 100%)	Barenburg, Ruehme, and Lueben fields, Lower Saxony; smaller fields in the States of Lower Saxony and Rheinland-Pfalz	1,800 [e]
Do. do.	BEB Erdgas und Erdöl GmbH (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Georgsdorf, Meppen, and Ruehlermoor fields, west of the Ems River (Emsland), Lower Saxony	3,000 [e]
Refined do.	Deutsche Shell AG	Refineries at Godorf, Hamburg, and Grasbrook	256,000 [e]
Do. do.	Raffinerie Heide GmbH (Klesch & Co. SA, 100%)	Refinery near Heide, State of Schleswig Holstein	35,000 [e]
Do. do.	Esso Deutschland GmbH (ExxonMobil Central Europe Holding GmbH, 100%)	Refineries at Karlsruhe and Ingolstadt	245,000 [e]
Do. do.	Ruhr Oel GmbH (Petróleos de Venezuela S.A., 50%, and BP Gelsenkirchen GmbH, 50%)	Refinery at Gelsenkirchen	215,500 [e]
Do. do.	BAYERNOIL Raffineriegesellschaft mbH (OMV AG, 45%; Ruhr Oel GmbH, 25%; AGIP Deutschland GmbH, 20%; Deutsche BP AG, 10%)	Refinery at Neustadt-Donau	145,000 [e]

See footnotes at end of table.

TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Platinum-group metals, refined	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	NA
Do.	Heraeus Precious Metals GmbH & Co. KG	Primary smelter and refinery and secondary plant at Hanau	NA
Do.	Umicore AG & Co. KG (Umicore S.A., 100%)	Plant at Hanau	NA
Do.	Allgemeine Gold- und Silberscheideanstalt AG (Umicore S.A., 91.21%, and other, 8.79%)	Plant at Pforzheim	NA
Potash, K_2O content	K+S Kali GmbH (K+S Group, 100%)	Mines at Hattorf, Neuhof-Ellers, Niedersachen-Riedel, Sigmundshall, Unterbreizbach, Wintershall, and Zielitz	6,000
Salt (evaporated and rock)	ESCO - European Salt Company GmbH & Co. KG [K+S Salz GmbH (K+S Aktiengesellschaft, 100%)]	Bernburg Mine and evaporated salt works; Borth Mine and evaporated salt works near Wesel; Braunschweig-Lüneburg Mine near Helmstedt	5,300 [e]
Do.	Wacker Chemie AG	Stetten rock salt mine near Haigerloch	500
Do.	Südsalz GmbH (Südwestdeutsche Salzwerke AG, 90%, and Vereinigte Schweizerische Rheinsalinen AG, 10%)	Rock salt mine at Berchtesgaden and evaporated salt works at Bad Reichenhall, Bavaria; and mine at Heilbronn and evaporated salt works at Bad Friedrichshall-Kochendorf, Heilbronn district, State of Baden-Wuerttemberg	5,000
Do.	Saline Luisenhall GmbH	Evaporated salt works at Göttingen	NA
Selenium, metal metric tons	Retorte GmbH (Aurubis AG, 100%)	Plant at Röthenbach	2,500
Silica sand (industrial sand)	Quarzwerke GmbH	Mines and plants at Frechen, Gambach, Haltern, Hohenbocka, and Weferlingen	4,500 [e]
Do.	Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerke GmbH, 100%)	Mines and plants at Hirschau and Schnaittenbach	850
Siliceous earth, silica	Hoffmann Mineral and Co. KG	Mine and plant near Neuburg	55
Silicon, metal metric tons	RW Silicium GmbH (Advanced Metallurgical Group N.V., 100%)	Four electric arc furnaces in plant at Pocking	32,000
Silver, metal	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	NA
Do. metric tons	Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luenen	1,300 [e]
Do. do.	Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Secondary (lead) smelters at Braubach am Rhein and Freiberg/Sachsen; primary (lead) smelter at Stolberg	400 [e]
Do.	Heraeus Precious Metals GmbH & Co. KG	Primary smelter and refinery and secondary plant at Hanau	NA
Do.	Umicore AG & Co. KG (Umicore S.A., 100%)	Plant at Hanau	NA
Do.	Allgemeine Gold- und Silberscheideanstalt AG (Umicore S.A., 91.21%, and other, 8.79%)	Plant at Pforzheim	NA
Soda ash	Solvay S.A.	Plant at Rheinberg	NA
Steel, crude	ThyssenKrupp Steel AG (ThyssenKrupp AG, 100%)	Bruckhausen and Beeckerwerth plants, near Duisburg	12,000
Do.	Salzgitter AG	Plants at Peine and Salzgitter	6,400 [e]
Do.	Hüttenwerke Krupp Mannesmann GmbH (ThyssenKrupp Steel AG, 50%; Salzgitter AG, 30%; Vallourec & Mannesmann Tubes SA, 20%)	Plant at Duisberg-Huckingen	5,600
Do.	ArcelorMittal Bremen GmbH (ArcelorMittal, 100%)	Plant at Bremen	4,000
Do.	Saarstahl AG (Struktur-Holding-Stahl GmbH & Co KG, 74.9%, and Dillinger Hüttenwerke AG, 25.1%)	Plants at Burbach, Neunkirchen, and Voelklingen	3,000
Do.	AG der Dillinger Hüttenwerke (Saarstahl AG, 33.75%; ArcelorMittal, 30.08%; Struktur-Holding-Stahl GmbH & Co KG, 26.17%; Dillinger Hütte und Saarstahl mbH, 10%; other, 4.72%)	Plant at Dillinger	2,800
Do.	ArcelorMittal Eisenhüttenstadt GmbH (ArcelorMittal, 100%)	Plant at Eisenhuettenstadt	2,400
Do.	Badische Stahlwerke GmbH	Plant at Kehl	2,300 [e]

See footnotes at end of table.

TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude—Continued	Brandenburger Elektrostahlwerk GmbH (RIVA FIRE S.p.A, 100%)	Plant at Brandenburg	1,700 [e]
Do.	Outokumpu Norosta GmbH (Outokumpu oyj, 100%)	Plants at Bochum and Krefeld	1,600 [e]
Do.	ArcelorMittal Ruhrort GmbH (ArcelorMittal, 100%)	Plant at Duisburg	1,500 [e]
Do.	Georgsmarienhütte GmbH	Plants at Bous, Georgsmarienhuette, and Groeditz	1,300 [e]
Do.	Stahlwerk Thüringen GmbH (Alfonso Gallardo S.A., 100%)	Plant at Unterwellenborn	1,100
Do.	Deutsche Edelstahlwerke GmbH	Plants at Siegen and Witten	1,100 [e]
Do.	Lech-Stahlwerke GmbH (Max Aicher GmbH & Co. KG, 100%)	Plant at Herbertshofen	1,100 [e]
Do.	ArcelorMittal Hamburg GmbH (ArcelorMittal, 100%)	Plant at Hamburg	1,100 [e]
Do.	Hennigsdorfer Elektrostahlwerk GmbH (RIVA FIRE S.p.A, 100%)	Plant at Hennigsdorf	1,000 [e]
Do.	Elbe-Stahlwerke Feralpi GmbH (Feralpi Siderurgica S.p.A., 100%)	Plant at Riesa	950 [e]
Strontium carbonate	Solvay & CPC Barium Strontium GmbH & Co. KG (Solvay S.A., 75%, and Chemical Products Corp., 25%)	Plant at Bad Hoenningen, near Hannover	95
Sulfur	Norddeutsche Erdgas-Aufbereitungs GmbH NEAG [BEB Erdgas und Erdöl GmbH (ExxonMobil Production Deutschland GmbH, 50%, and Royal Dutch Shell plc, 50%), 100%]	Natural gas desulfurization plants at Grossenkneten and Voigtei (near Nienburg-Weser), Lower Saxony	600
Sulfuric acid	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Acid plant, part of primary copper production facilities at Hamburg	2,500 [e]
Do.	BASF SE	Plant at Ludwigshafen	NA
Do.	Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Plant near primary lead smelter at Stolberg	NA
Do.	Evonik Degussa GmbH (Evonik Industries AG, 100%)	Plant at Worms	NA
Do.	Lanxess AG	Plant at Leverkusen	NA
Do.	Weser Metall GmbH (Recylex S.A., 100%)	Acid plant near primary lead smelter and refinery at Nordenham	55
Do.	Metaleurop Zinkbetrieb GmbH & Co. KG (Glencore plc, 100%)	Acid plant near primary zinc smelter and refinery at Nordenham	NA
Tin alloys, tinplate	ThyssenKrupp Rasselstein GmbH	Plant at Andernach	NA
Zeolites	Hans G. Hauri Mineralstoffwerk GmbH	Mine and plant at Boetzingen, near Freiburg	NA
Zinc, metal	Metaleurop Zinkbetrieb GmbH & Co. KG (Glencore plc, 100%)	Nordenham smelter, near Bremerhaven	160
Zinc, oxides	Harz Metall GmbH (Recylex S.A., 100%)	Waëlz rotary kilns at Oker-Goslar	80 [e]
Do.	Norzinco GmbH (Recylex S.A., 100%)	Secondary plant at Harlingerode	20
Zinc, powder	do.	do.	5

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Table includes data available through February 27, 2016.

[2] In addition to producing arsenic as a byproduct of chemical manufacturing and gallium as a byproduct of aluminum production, PPM Pure Metals GmbH produces small quantities of germanium as a byproduct of processing imported ores and concentrates and small quantities of indium and tellurium as byproducts of zinc metal production by PPM's parent company, Recylex S.A.

THE MINERAL INDUSTRY OF GREECE

By Sinan Hastorun

Greece is a moderately developed, mountainous country with long coastline in southeastern Europe that borders Albania, Bulgaria, Macedonia, and Turkey. The country's territory onsists of a peninsular mainland at the southern tip of the Balkan Peninsula and about 2,000 islands in the Aegean, Ionian, nd Mediterranean Seas. Despite its relatively small size, Greece has significant extractable deposits of a variety of minerals, particularly metals, such as aluminum, bauxite, copper, gold, nickel, silver, and zinc; industrial minerals, such as bentonite, feldspar, gypsum, huntite (a magnesium carbonate mineral used as a fire retardant for polymers), kaolin, magnesite, perlite, and pumice; and mineral fuels, such as lignite coal. The total gross value of indicated resources of metals was EUR72 billion ($92 billion[1]), while that of indicated resources of industrial minerals and stones was about EUR60 billion ($77 billion). The total gross value of indicated resources of mineral fuels and related materials was estimated to be EUR1,362 billion ($1,739 billion), of which lignite coal made up EUR268 billion ($342 billion); petroleum EUR685 billion ($875 billion); and natural gas, EUR409 billion ($522 billion). The total gross value of proven and probable reserves of minerals in Greece was estimated to be about EUR1.5 trillion ($1.9 trillion) (Tsirambides and Flippidis, 2012a, p. 709; 2012c, p. 642; 2013, p. 1; Charalampides and others, 2013, p. 144–145; Encyclopedia of the Nations, 2014; U.S. Central Intelligence Agency, 2014).

The mineral industry of Greece continued to maintain leading positions regionally and globally in the production and exporting of bentonite, huntite, magnesite, perlite, and pumice, despite the lingering effects of the country's multiyear economic recession, which has significantly reduced investment in the mineral industry and domestic consumption of mineral commodities since 2008. In 2014, Greece was the world's 2d-ranked perlite producer, 3d-ranked pumice producer, 4th-ranked bentonite producer, and 12th-ranked bauxite producer. The country accounted for about 27% of world perlite production in 2014; pumice, 7%; bentonite, 6%; and bauxite, 1% (Tsirambides and Flippidis, 2012b, p. 38; Bennett, 2016; Bray, 2016a, b; Crangle, 2016; Flanagan, 2016).

Recent mineral exploration by private companies and geologic studies conducted by the Institute of Geology and Mining Exploration (IGME) onshore and the two-dimensional seismic survey of Greece's Exclusive Economic Zone (EEZ) offshore in the Ioanian and Mediterranean Seas, which were completed in 2013, have increased estimates of the country's indicated resources of minerals, in particular precious metals and mineral fuels. Greece had estimated resources of 2.6 Mt of copper, 2.4 Mt of manganese, 1.5 Mt of nickel, 1.2 Mt of chromite, 2,800 metric tons (t) of silver, and 500 t of gold. Greece's industrial mineral resources were estimated to contain 1,200 million metric tons (Mt) of perlite, 600 Mt of zeolites, 400 Mt of pozzolan and pumice, 350 Mt of gypsum, 280 Mt of magnesite, 250 Mt of bauxite, 100 Mt each of bentonite and diatomite, 80 Mt of feldspar, 50 Mt each of olivinite and kaolin, 5 Mt of quartz, and 4 Mt of huntite. Mineral fuel resources were estimated to be 6,700 Mt of lignite coal, 10 billion barrels of petroleum, 3.5 trillion cubic meters of natural gas, and 1,800 t of uranium. Oil and gas shale reservoirs were also present in Greece (Charalampides and others, 2013, p. 144, 145; Tsirambides and Flippidis, 2013, p. 1, 4; GeoExPro, 2014; Institute of Geology and Mineral Exploration, 2014; Tsirambides, 2015, p. 1, 5).

Minerals in the National Economy

In 2014, Greece's real gross domestic product (GDP) increased by 0.8%, which was the first time that it increased since 2007. The nominal GDP was $237.6 billion in 2014. The increase in economic activity after 5 years of continuous contraction in Greece was mainly owing to an increase in private consumption and net exports. Exports of services increased mainly owing to tourism and shipping sector exports; exports of goods also rose. Investment increased for the first time since 2008 mainly owing to investment in equipment by private industry (European Commission, 2015b, p. 80; Hellenic Statistical Authority, 2015a, p. 1; World Bank, 2015).

Historically, mineral extraction and processing has been an important segment of Greece's industrial production, but its significance has declined in the past 20 years. The contribution to GDP of the mineral industry, which included quarrying, processing, and production of intermediate and final products, decreased to 2% in 2014 from between 3% and 5% in past years. This decrease was owing in part to the continuing effects of the global economic downturn since 2009, which has reduced global demand for and global prices of key mineral commodities produced by Greece, such as cement and steel, and in part to reduced business investment in mineral extraction. The cumulative nominal value of Greece's mineral production for the 6 years between 2009 and 2014 was about EUR18 billion to EUR20 billion ($23 billion to $26 billion). The mineral industry employed about 23,000 workers in 2014 (Tsirambides and Flippidis, 2012b, p. 38; Charalampides and others, 2013, p. 144; Greek Mining Enterprises Association, 2014, p. 2; Tzeferis, 2015, p. 2, 3).

Most segments of Greece's industry continued to contract in 2014, but at a lower rate than they did in 2013. Total industrial production decreased by 2.7% in 2014, which was less than the 3.2% decrease in 2013, whereas manufacturing output increased by 0.7% compared with a decrease of 1.1% in 2013. Mining and quarrying output decreased by 0.5% in 2014 compared with a decrease of 11.5% in 2013. The mining of coal and lignite decreased by 6.7% in 2014 (14.4% in 2013); the extraction of crude petroleum and natural gas, by 15.5% (7.9% in 2013);

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783= US$1.00 for 2013.

the manufacture of nonmetallic mineral products, by 0.2% (1.9% in 2013); and the manufacture of fabricated metal products, by 1.3% (8.2% in 2013). The mining of metal ores increased by 4.0% in 2014 compared with a decrease of 15.3% in 2013, while the manufacture of base metals increased by 5.5% compared with a decrease of 4.9% in the previous year. The manufacture of coke and refined petroleum products increased by 7.3% in 2014 compared with an increase of 4.2% in 2013 (Hellenic Statistical Authority, 2015f, p. 4).

Government Policies and Programs

In 2014, the mineral industry was regulated by the Mining Code of 1973, Legislative Decree 210/1973, as amended by a number of laws and ordinances on technical and procedural issues, such as law No. 669/1977 on the exploitation of ornamental rocks and industrial minerals; law No. 428/84, as amended by law No. 2115/93 on the exploitation of aggregates; and the Regulation on Mining and Quarrying Activities, KMLE, MD2223/11, which included the Health and Safety Regulation for Mining. Greece's mineral industry was also subject to the European Union's Environmental Impact Directives 85/337/EC and 97/11/EC, the Habitats Directive 92/43/EC, and the Mining Waste Directive 2006/21/EC. In 2012, royalties were increased on the stages of mineral production. Specifically, a 12% royalty was imposed on the ore sale price "ex works," 8% on free on board (f.o.b.) price, 4% on f.o.b. price following mechanical preparation (crushing), 2% on concentrates, and 1.5% on final product (United Nations, 2012, p. 16; Bahas, Gramatidis and Partners, 2013; Greek Mining Enterprises Association, 2014, p. 7).

The Acceleration and Transparency Regarding the Realization of Strategic Investments Law of 2010, law No. 3894/2010 (known as the Fast-Track Law), set up expedited licensing by Enterprise Greece, the public investment promotion authority, for qualifying investments in industry and energy, among other sectors, if the invested funds exceed a specified threshold or create a specified number of new jobs. In June 2014, this law was supplemented by law No. 4262/2014, which simplified the licensing procedure for the exercise of business activities and other provisions in economically important sectors, such as mining and energy (G. Verveniotis and Partners, 2014, p. 2; Government Gazzette of the Hellenic Republic, 2014; U.S. Department of State, 2015, p. 6).

Minerals are legally classified as either quarry minerals or ores. Quarry minerals are divided into three subcategories: aggregates, ornamental rocks, and industrial minerals. Quarries are required to be located in areas with suitable geologic resources in predefined quarrying areas in accordance with law No. 1428/84, as amended by law No. 2115/93. Ores include metals and their compounds, radioactive minerals, and mineral fuels, as well as asbestos, feldspar, fluoride, salt, sulfur, and talc. Quarry minerals belong to the owner of the land, who holds an exclusive right to explore and extract them, while ores belong to the State and are conceded with a presidential decree or in rare cases, leased. The National Policy for the Strategic Planning and Exploitation of Mineral Resources was adopted in February 2012 to ensure the supply of minerals to society in a sustainable way and in compliance with national development policies (United Nations, 2012, p. 16, 17; Ministry of Environment, Energy, and Climate Change, 2013, p. 18; Greek Mining Enterprises Association, 2014, p. 7; Tzeferis, 2015, p. 7).

Licenses for mineral exploration (stage 1) and mining concessions (stage 2) are issued by a presidential decree after consultation with the Ministry of Reconstruction of Production, Environment and Energy (YPAPEN, formerly known as YPEKA). The mining concession only establishes the right of mine ownership for the holder of the exploration license. Mineral extraction at the site of the concession requires an exploitation permit (stage 3) that is contingent upon the approval of an Environmental Impact Assessment (EIA) study by the YPAPEN. The YPAPEN is the competent authority for controlling the technical and environmental impacts of mineral development activities and ensuring that mineral extraction is in line with the economic interests of Greece. The IGME advises the YPAPEN on geologic and technical aspects of projects. Inspectorates of Mines of Northern and Southern Greece are responsible for supervising the compliance of mines with the provisions of the mining laws and regulations (United Nations, 2012, p. 16–20; Greek Mining Enterprises Association, 2014, p. 7).

Upstream oil and gas activities in Greece are governed by the Hydrocarbons Law, Law No. 2289/1995, as amended in 2011 to incorporate the European Union (EU) Directive 94/22/EC on the conditions for granting and using authorizations for the prospection, exploration, and production of hydrocarbons. The Hellenic Hydrocarbons Resources Management Company S.A. (HHRM) manages hydrocarbons prospecting, exploration, and exploitation rights onshore and offshore on behalf of the Government under supervision by the YPAPEN. Nonexclusive prospecting licenses are issued for a term of 18 months. Exclusive rights to hydrocarbons exploration and exploitation in specific areas are granted to private parties either through a lease agreement or a production-sharing agreement (PSA) with the HHRM following an invitation to tender. The maximum duration of the exploration stage is 7 years for onshore areas and 8 years for offshore, while that of the exploitation stage is 25 years and may be extended for two 5-year periods (Assimakis and others, 2015).

Production

In 2014, the output of the mineral industry of Greece continued to decrease in terms of both total value and volume, as it has done since 2009. The production of most minerals, however, did not change substantially from that of 2013. The production of screened perlite increased by 17%; crude perlite, by 11%; lead (mine output, Pb content) and nickel (metal, Ni content of ferronickel), by 9% each; iron ore, by 7%; and marble, by 5%. Silica output decreased by 100%; huntite, by 65%; salt, by 23%; crude petroleum, by 16%; gypsum and anhydrite, by 13%; lignite coal, by 8%; and natural gas, by 7% (table 1).

Structure of the Mineral Industry

The majority of Greece's mining companies were privately owned. Government ownership was limited primarily to the mineral fuels sector and nickel. The State owned 55.2% of the shares of LARCO G.M.M. S.A., which was the fifth-ranked nickel-producing company in the world. S&B Industrial Minerals S.A., which was the leading producer of such industrial minerals as bentonite and perlite in Greece, was acquired in November 2014 by Imerys S.A. of France, which was the world's leading industrial minerals group. The acquisition included the entire operations of the group except for its bauxite operations. Greece's major mineral commodities and the companies that produced them in 2014 are listed in table 2 (Enterprise Greece, 2012; Imerys S.A., 2014, p. 1; O'Driscoll, 2015, p. 1; Tzeferis, 2015, p. 6).

In 2014, 181 marble quarries were operating in Greece. About 80 of them (44%) were located in the Prefectures of Drama and Kavala in the Eastern Macedonia region and accounted for 82% of the country's total marble production. Ten marble quarries on the Cyclades Islands made up about 11% of marble output, and 25 quarries in Sterea Helles accounted for 4% of output. Approximately 150 quarries in about 120 authorized quarry sites in rural areas of Greece produced construction aggregates, such as gravel, sand, and stone; authorized quarries produced about one-half of the total annual aggregate output (Ministry of Environment, Energy, and Climate Change, 2013, p. 22; Laskaridis and others, 2014, p. 16, 17; Tzeferis, 2015, p. 7).

Mineral Trade

The total value of Greece's exports decreased by 1.3% to about EUR27.2 billion ($34.7 billion) in 2014, whereas total imports increased by 2.3% to about EUR48.0 billion ($61.2 billion). As a result, the country's trade deficit increased by 7.4% to reach EUR20.8 billion ($26.5 billion). Other EU member states were Greece's leading trade partners, accounting for 48% of its exports and imports (Hellenic Statistical Authority, 2015b, p. 2; 2015d).

Mineral fuels, lubricants, and related materials continued to be the leading export and import goods of Greece. In 2014, they accounted for about 38% of total exports and about 33% of imports by value. The main destinations of Greece's exports of mineral fuels, lubricants, and related materials were Turkey (23%), Saudi Arabia (6%), Italy (6%), Gibraltar (6%), Lebanon (5%), Egypt (5%), Macedonia (4%), Cyprus (4%), and Bulgaria (2%). The main sources of Greece's imports of mineral fuels, lubricants, and related materials were Russia (28%), Iraq (24%), Kazakhstan (15%), Saudi Arabia (7%), Egypt (4%), Libya (4%), and Azerbaijan (2%) (Hellenic Statistical Authority, 2015c, d).

The mineral industry of Greece was highly export-oriented owing in large part to the significant decrease in the domestic consumption of minerals since 2008. Exports accounted for about 65% to 70% of the industry's total value of sales and were cumulatively valued at about EUR10 billion ($13 billion) or about 7% of total exports for the 2009–14 time period. The leading mineral commodity exports were aluminum, bauxite, bentonite, magnesite, marble, nickel, perlite, and pumice in 2014. Greece exported about 1.0 Mt of bentonite, which accounted for almost 100% of output. The country's marble exports increased substantially over the past 5 years to reach 776,000 t in 2014. China was the leading importer of marble from Greece and accounted for 57% of marble exports by weight and 38% by value; it was followed by the United States, the United Arab Emirates, Saudi Arabia, Singapore, Qatar, Italy, and Turkey. Greece exported 422,000 t of bauxite in 2014, which accounted for 22% of the country's bauxite output. It also exported most of its pumice output of about 430,000 t to the United States and other EU member states. Greece's aluminum exports to other EU member states increased to 106,800 t in 2014 from 100,900 t in 2013, while exports to non-EU countries worldwide increased to 5,500 t from 2,400 t in 2013. Exports accounted for 66% of aluminum (primary metal) output (Hellenic Statistical Authority, 2015e; Tzeferis, 2015, p. 3–10).

Greece's exports to the United States were valued at $1.05 billion in 2014. Mineral exports to the United States included aluminum and bauxite, $63.7 million; cement, sand, and stone, $59.7 million; petroleum products, $8.4 million; iron and steel products, $2.2 million; organic chemicals, $2.1 million; and nickel, $204,000. Greece's imports from the United States were valued at $773.2 million. Mineral imports from the United States, included petroleum products, $58.3 million; copper, $31.7 million; nonferrous metals, $2.4 million; iron and steel products, $854,000; aluminum and alumina, $312,000; and natural gas liquids, $246,000 (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Greece continued to be a leading bauxite producer among EU countries. Total bauxite output remained at about the same level as in 2013, which provided for the entire domestic demand for metallurgical use by aluminum producers, and for nonmetallurgical use by cement and steel producers as well as contributing to the country's mineral exports. The three leading producers of bauxite in Greece were European Bauxites S.A., with output of 970,000 t; Delphi Distomon S.A., 633,000 t; and Hellenic Mining Enterprises S.A., 269,000 t (Tzeferis, 2015, p. 4).

Aluminium S.A., which was the largest integrated producer of aluminum and alumina in Greece and the EU, produced about the same amount of aluminum in 2014 as in 2013, consuming more than 75% of the country's production of bauxite ore. The company's production of alumina hydrate increased to match its 2011 levels, which allowed for increased production of ceramics and filters (Tzeferis, 2015, p. 4).

Gold, Lead, Silver, and Zinc.—Hellas Gold S.A., which was a subsidiary of Eldorado Gold Corp. of Canada, produced about 220,000 t of lead, zinc, and iron concentrates in 2014, which was about the same level as in 2013. The company exported about EUR18 million ($23 million) worth of lead sulfide concentrates and EUR22 million ($28 million) worth of zinc sulfide concentrates. It shipped its concentrates from the Ports of Stratoni and Thessaloniki to facilities in Europe (Tzeferis, 2015, p. 4–5).

In 2014, Hellas Gold mined and processed 219,861 t of ore grading at 178 grams per metric tons (g/t) silver, 5.9%

lead, and 10.5% zinc at the Stratoni underground silver-lead-zinc mine, which is located on the Halkidi Peninsula in northern Greece and produced 58,375 t of lead, silver, and zinc concentrate. The company used a multistage flotation process to extract a lead-zinc concentrate and a zinc concentrate. The Stratoni Mine's estimated proven and probable reserves (reported as "2P reserves") were 128 t of silver, 54,000 t of lead, and 80,000 t of zinc. In 2014, Hellas Gold also produced 503 kilograms (kg) of gold through tailings retreatment at the pre-existing Olympias gold-silver-lead-zinc mine at Halkidi. The Olympias Mine's estimated 2P reserves were 120 t of gold, 1,880 t of silver, 693,000 t of lead, and 921,000 t of zinc (Eldorado Gold Corp., 2015a, d).

Hellas Gold was in the process of developing the Skouries gold-copper porphyry deposit at Halkidi and the Perama Hill epithermal gold-silver deposit, which is located in the Thrace region of northern Greece. The estimated proven reserves were 86 t of gold, 9 t of silver, and 394,000 t of copper, and the estimated probable reserves were 78 t of gold, 31 t of silver, and 382,000 t of copper (Eldorado Gold Corp., 2015b, c).

Nickel.—Greece was the only country in the EU with extensive nickel laterite deposits. Larco G.M.M. S.A., which was a leading producer of nickel and ferronickel in Europe and the only European consumer of Greece's nickel ore output, mined sedimentary-type nickel laterite deposits by surface (open pit) and underground mining methods. In 2014, the company's nickel production increased by 10%, while its sales volume rose by 5%. Larco mined 2.4 Mt of nickeliferous laterite ore from the Agios Ioanis, Evia, and Kastoria Mines in 2014 compared with 2.2 Mt in 2013. The company continued to incur financial losses, although at a lower level than in the previous year. The Government explored the possibility of inviting a strategic investor for Larco and announced plans to restructure the company ahead of its privatization. In March 2014, the European Commission (EC) found that Larco had received state aid in breach of EU rules, which gave it an undue advantage over its competitors. The Commission ordered the company to pay back funds provided by the Government and public guarantees with interest. It also determined that the repayment obligation would not be assumed by prospective buyers of Larco's assets through privatization (European Commission, 2014b; Larco G.M.M. S.A., 2014; Tzeferis, 2015, p. 3–4).

Industrial Minerals

Bentonite and Perlite.—The production of bentonite and perlite ores from the island of Milos and other locations in the country remained about the same in 2014 as in 2013. S&B Industrial Minerals S.A. maintained its position as the leading producer of bentonite in Europe and the largest exporter of bentonite in the world. The company's sales of bentonite consisted entirely of exports. S&B Industrial Minerals was acquired by Imerys of France in November 2014. The acquisition of S&B Industrial Minerals constituted the largest ever foreign investment made into a Greek-owned business by monetary value (Tzeferis, 2015, p. 6).

Cement.—Cement production continued to increase at a slow rate and recovered some of its losses from the substantial contraction of the Greek construction industry since 2008. Cement consumption in Greece was about 2.5 Mt in 2014, which was 80% below its 2006 peak of 11.6 Mt. It continued to be driven by public infrastructure projects, some of which were resumed during the year. Residential construction remained at a relatively low level (Hellenic Cement Industry Association, 2014; TITAN Group, 2015, p. 28, 29; Tzeferis, 2015, p. 3).

TITAN Group, which was the leading cement producer in Greece and Southeastern Europe, returned to profitability in 2014 after incurring losses in the previous 2 years. This was in part owing to increased demand for building materials and the relaunching of road building in Greece. Capacity utilization at TITAN's cement plants in Greece was dependent on exports and in particular the level of demand for cement by countries with low energy costs and no carbon dioxide emission constraints (Global Cement, 2015).

Magnesite.—Grecian Magnesite S.A., which was a leading magnesite producer and exporter in the EU and in the world, operated mines and production sites at Chalkidi on the Halkidi Peninsula in northern Greece. The Chalkidi deposits consisted of three main active concessions—Yerakini with an area of 7 square kilometers (km^2); Ormilia, 10 km^2; and Kastri, 23 km^2. The company also owned reserve concessions totaling 16 km^2 for future exploitation. In 2014, the company's production of magnesite ore from concessions 20, 21, and 22 at Halkidi decreased slightly to about 274,000 t. Grecian Magnesite produced 26,000 t of dead-burned magnesia, 61,000 t of caustic-calcined magnesia, and 41,000 t of refractory masses in 2014 (Grecian Magnesite, S.A., 2015; Tzeferis, 2015, p. 5).

Terna Magnesite S.A. (Terna Mag), which was a recently established company, took over operations at Biomagn in north Evia. The company planned to extract the old magnesite deposits of Gerorema and Kakkavos in north Evia and to modernize the old furnace installations at Mantoudi to produce magnesium compounds. In 2014, Terna Mag produced about 86,300 t of raw magnesite and, for the first time, 9,300 t of caustic magnesia (Tzeferis, 2015, p. 5–6).

Sibelco Hellas S.A.'s production of huntite from its concessions 72 and 74, which are located at Servia Kozania, continued to decline substantially. In 2014, the company's crude mineral output decreased to 5,300 t, while its sales of finished products decreased by about 38% compared with those of 2013 (Tzeferis, 2015, p. 6).

Mineral Fuels

In 2013 (the latest year for which comprehensive data were available), Greece's primary sources of energy were crude oil and petroleum products (46.2%), coal (30.1%), natural gas (14.1%), and renewable energy, such as biomass, hydropower, and solar thermal systems (9.6%). Electricity was generated mainly by lignite coal (50.3%), natural gas (23.5%), renewable energy sources (14%), and crude oil and petroleum products (10%). Greece was dependent on imports for about 68% of its energy needs. The Government's official target, which was established by the National Renewable Energy Action Plan in compliance with the EU Directive 2009/28/EC, was to increase Greece's share of renewable energy in gross final energy consumption to 20% by 2020 (Ministry of Environment, Energy, and Climate Change, 2010, p. 7; European Commission, 2014a, p. 6; 2015a, p. 58; Tzeferis, 2015, p. 8).

Coal.—Greece was the third-ranked producer of lignite in the EU after Germany and Poland. Its estimated reserves of 7 billion metric tons were among the highest in Europe. Lignite was primarily used for electricity generation in powerplants owned by Public Power Corp. S.A. (PPC), which was also Greece's leading lignite producer. In 2014, PPC's lignite output decreased by 13% to about 48 Mt from about 54 Mt in 2013. The company extracted about 39.1 Mt of lignite at the West Macedonia Lignite Centre and 8.9 Mt at the Megalopolis Lignite Centre (Tzeferis, 2015, p. 8).

Petroleum and Natural Gas.—Greece was dependent on imports for almost 100% of its natural gas and 98% of its oil consumption. Kavala Oil S.A., which was a subsidiary of Energean Oil & Gas S.A., was the only hydrocarbons producer in Greece. The company produced about 1,300 barrels per day (bbl/d) of oil from its Prinos offshore oilfield, 200 bbl/d of oil from its Prinos North offshore oilfield, and 60,000 cubic meters of natural gas and 200 bbl/d of gas condensate from the South Kavala gasfield in the Gulf of Kavala (European Commission, 2014a, p. 6; Kavala Oil S.A., 2014; Energean Oil & Gas S.A., 2015d, e; Tzeferis, 2015, p. 8).

Energean expected to increase its oil production by about 5,000 bbl/d in 2015—2016 by drilling seven new producing wells and upgrading three existing wells at Prinos. The remaining 2P reserves of the Prinos oilfield were estimated to be 11.9 million barrels (Mbbl) of oil. The company was also in the process of implementing extended reach drilling in the Prinos North oilfield, which would increase its production to 1,500 bbl/d. Prinos North was estimated to hold 3.4 Mbbl of oil in 2P reserves. Energean also developed a field development plan of the Epsilon offshore oilfield, which was estimated to hold 15 Mbbl of oil in 2P reserves (Energean Oil & Gas S.A., 2015a–c).

In September 2014, the Parliament ratified the hydrocarbon exploration and exploitation agreements for three areas that had been signed with three international consortia in July 2013 following Greece's first international hydrocarbons tender. Combined oil reserves for the concession areas onshore and offshore were estimated to be 305 Mbbl of oil. The first concession was awarded to Energean and Petra Petroleum Inc. of Canada for an onshore block at Ioannina in northwestern Greece; the second, to Energean and Trajan Oil and Gas Ltd. of the United Kingdom for the area of Katakolo in western Pelopennese; and the third, to ELPE, Edison Hellenic Petroleum SA of Italy, and Petroceltic International PLC of Ireland for an offshore block in the Gulf of Patras. In November 2014, the YPEKA announced a second international tender for hydrocarbon exploration and exploitation of 20 offshore blocks in Greece's EEZ south of the island of Crete and in the Ionian Sea and 3 onshore sites in western Greece. Agreements with selected bidders were expected to be signed in the fall of 2015 (Hellenic Republic, 2014; Papamichalopoulos and others, 2015, p. 97, 98).

The four recently upgraded refineries in the country had a total crude oil distillation capacity of about 490,000 bbl/d in 2012 (the latest year for which data were available). About two-thirds of the capacity was held by the three refineries owned by Hellenic Petroleum S.A.; two of the refineries were located in the Athens area, and one was located near Thessaloniki. The remaining one-third of the total distillation capacity was held by the Corinth refinery, which was owned by Motor Oil Hellas. The four refineries processed more than 22 Mt (440,000 bbl/d) of crude oil in 2012, which was equivalent to a capacity utilization rate of 85%. Total refined products output was 474,000 bbl/d, which included distillate fuel oil (34%), gasoline (23%), residual fuel oil (21%), and liquefied petroleum gas (4%) (International Energy Agency, 2014, p. 221).

Outlook

Greece is expected to remain a globally significant producer and exporter of bauxite, bentonite, perlite, and pumice. The mineral industry of Greece is likely to continue to recover from the lingering effects of the global economic downturn of 2008 and the country's recent recession that substantially reduced domestic and global demand for minerals such as construction aggregates, cement, and steel. The metals and industrial minerals sectors will remain as two of the most competitive industries in the country and exports of aluminum, bauxite, bentonite, marble, magnesite, perlite, and pumice are likely to increase. Greece may become a significant producer of precious metals such as gold and silver in Europe in the medium term if mineral exploration projects by Eldorado Gold advance to the extraction phase as planned. Zeolite deposits in the Evros region may also be extracted in the future. New offshore and onshore hydrocarbon exploration by three international consortiums is expected to begin in 2015. Exploration activity may yield higher indicated oil and natural gas reserves in Greece's exclusive economic zone in the Ionian and Mediterranean Seas and significantly increase the country's hydrocarbons output. The success of these efforts in increasing Greece's mineral output, however, is contingent on the resolution of the political uncertainty regarding Government formation, the economic uncertainty related to debt negotiations with the EU and the International Monetary Fund in 2015, and on the ability of mineral extractors to overcome public opposition to their projects (Michaletos, 2013; European Commission, 2015b, p. 80; Tzeferis, 2015, p. 3, 5, 8, 10).

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TABLE 1
GREECE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Bauxite		1,993,835 [r]	2,324,000 [r]	1,816,000	1,844,000	1,872,710
Alumina, Al_2O_3		725,000	809,700	784,400	811,600 [r]	813,000
Metal, primary		136,765	165,147 [r]	165,046	169,457 [r]	173,164
Chromite, ore, crude		650 [r]	570 [r]	576 [r]	-- [r]	-- [e]
Iron and steel:						
Iron ore and concentrate, nickeliferous, gross weight		2,260,000 [r]	2,260,000 [r]	2,306,000	2,220,790	2,382,485
Fe content[e]		560,000	560,000	571,000 [r]	550,000	590,000 [e]
Steel, crude	thousand metric tons	1,821 [r]	1,934 [r]	1,247 [r]	1,030 [r]	1,000 [e]
Lead, mine output, Pb content		17,674 [r]	16,592	18,630 [r]	16,890 [r]	18,481
Nickel:						
Ore, gross weight	thousand metric tons	1,903 [r]	2,236 [r]	2,257 [r]	2,221 [r]	2,382 [e]
Metal, Ni content of ferronickel		13,960	18,527	18,630 [r]	16,890	18,481
Silver, mine output, Ag content	kilograms	29,000	33,316 [r]	39,759 [r]	39,028	39,000 [e]
Zinc, mine output, Zn content		18,400 [r]	20,999 [r]	23,196 [r]	22,512 [r]	22,752
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	10,010 [r]	6,110 [r]	6,918 [r]	7,819 [r]	8,000 [e]
Clays, bentonite, crude		1,381,643	1,188,442	1,235,105	1,000,000 [r]	1,011,485
Feldspar		45,200 [r]	27,500 [r]	33,800 [r]	-- [r]	--
Gypsum and anhydrite		749,768 [r]	590,000 [r]	700,000	760,000	664,288
Magnesite:						
Ore, crude		513,487 [r]	541,813	351,266	383,000 [r]	363,000
Huntite, crude		16,350 [r]	23,800	24,200	15,200	5,340
Perlite:						
Crude		816,873 [r]	842,870	876,396	890,000	985,328
Screened		440,000 [r]	507,235	400,000	435,000	507,336
Pozzolan, Santorin earth		550,000 [r]	350,000	285,000	266,000	270,000
Pumice		412,700 [r]	468,960	281,000 [r]	420,000	429,872
Salt, all types		164,000 [r]	174,500	191,970	189,500 [r]	146,402
Silica		5,742 [r]	1,671	-- [r]	10,000 [r]	--
Stone, marble	cubic meters	268,033 [r]	285,000	200,000 [r]	220,000 [r]	232,000
Sulfur, S content of mixed sulfide ore		230,134 [r]	214,943	227,197	230,000	230,000 [e]
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite	thousand metric tons	53,600	58,400	62,335 [r]	55,500 [r]	50,800
Gas, natural, gross production	thousand cubic meters	6,125 [r]	5,927 [r]	6,402	5,415	5,062
Petroleum:						
Crude	thousand 42-gallon barrels	894 [r]	676	662 [r]	609 [r]	514
Refinery products:[e]						
Liquefied petroleum gas	do.	8,030 [3]	6,100 [r]	6,000 [r]	5,500 [r]	4,600
Gasoline	do.	36,865 [3]	27,900 [r]	27,300 [r]	25,100 [r]	21,200
Naphtha	do.	8,400 [3]	6,400 [r]	6,300 [r]	5,800 [r]	4,900
Jet fuel	do.	12,775 [3]	9,700 [r]	9,500 [r]	8,700 [r]	7,300
Kerosene	do.	146 [3]	110 [r]	110 [r]	100 [r]	80
Distillate fuel oil	do.	51,468 [3]	38,900 [r]	38,100 [r]	35,000 [r]	29,500
Refinery gas	do.	4,800 [3]	3,600 [r]	3,500 [r]	3,200 [r]	2,700
Residual fuel oil	do.	37,814 [3]	28,600 [r]	28,000 [r]	25,800 [r]	21,800
Bitumen	do.	4,000	3,000 [r]	2,900 [r]	2,700 [r]	2,300
Other	do.	1,800	1,400 [r]	1,400 [r]	1,300 [r]	1,100
Total	do.	166,100	125,700 [r]	123,100 [r]	113,200 [r]	95,500

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1] Table includes data available through September 1, 2015.

[2] In addition to the commodities listed, dolomite, lignite briquets, manganese, and crude construction materials were produced, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

TABLE 2

GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, Al_2O_3		Aluminium S.A. (Mytilineos Holdings S.A., 53%)	Agios Nikolaos, Boeotia area	1,100
Aluminum		do.	do.	180
Barite, $BaSO_4$		S&B Industrial Minerals, S.A. (Imerys S.A., France)	Mines at Adamas, Milos Island	NA
Bauxite		European Bauxites S.A.	Mines at Amfissa and Distomon, plants at Phocis and Itea	2,000
Do.		Delphi-Distomon S.A. (Mytilineos Holdings S.A.)	Mines at Amfissa and Distomon	800
Do.		Hellenic Mining Enterprises. S.A.	Mines at Aga Marina, Lamia	500
Bentonite:				
Crude		Mediterranean Bentonite Co. S.A. (Industria Chimica Mineraria S.p.A.)	Surface mines on Milos Island	20
Do.		Mykobar Mining Co. S.A. (Silver & Baryte Ores Mining Co. S.A.)	Mines at Adamas, Milos Island	300
		do.	Plants at Adamas, Milos Island	200
Do.		S&B Industrial Minerals, S.A. (Imerys S.A.)	Mines at Adamas, Milos Island	600
Processed		do.	Plant at Voudia Bay, Milos Island	400
Cement		Halkis Cement Co. S.A. (Lafarge Group, 89%)	Micro-Vathi plant, west-central (closed)	3,000
Do.		Halyps Cement S.A. (Ciments Français Group)	Paralia Aspropyrgos plant, Athens	800
Do.		Heracles General Cement S.A. (Lafarge Group)	Plants at Evia, Milaki Evia, and Volos	9,600
Do.		TITAN Cement Co. S.A. (TITAN Group)	Elefsis plant, Athens area	400
Do.		do.	Kamari plant, Boeotia	2,600
Do.		do.	Patras plant, northern Peloponnesus	1,900
Do.		do.	Salonica plant, Salonica	1,650
Chromite		Financial-Mining-Industrial and Shipping Corp. (FIMISCO)	Tsingeli Mine, Volos	25
Coal, lignite		Public Power Corp. S.A. (PPC)	Megalopolis and Ptolemais Mines	63,000
Ferroalloys, ferronickel, Ni content		Larco G.M.M. S.A.	Larymna metallurgical plant	25
Gold, Au in concentrate	kilograms	Eldorado Gold Corp.	Kassandra Mines (Olympias)	5,000
Gypsum		Lava Mining and Quarrying Co. S.A.	Altsi, Crete Island	500
Do.		TITAN Cement Co. S.A. (TITAN Group)	do.	280
Huntite/Hydromagnesite		Microfine S.A.	Mines in Kozani Basin	100
Lead, mine, Pb in concentrate		Hellas Gold S.A. (Eldorado Gold Corp.)	Kassandra Mines (Olympias and Stratoni), northeastern Chalkidiki	30
Magnesite, concentrate		Grecian Magnesite S.A. (GM)	Mine and production facilities at Chalkidiki, Halkidiki, and Yerakini, northern Greece	300
Do.		Terna Magnesite (Terna Mag)	Gerorema Mine	100
Manganese, battery-grade MnO_2		Eleusis Bauxite Mines Mining, Industrial and Shipping S.A. [National Bank of Greece (OAE)]	Nevrokopi, Drama	10
Marble, slab and tile	cubic meters	Aghia Marina Marble Ltd.	Various areas of northern Greece	NA
Do.	do.	Michelakis Marble S.A.	Kavala	NA
Do.	do.	Gourlis Group	Quarries at Levadia, Neurokopi, and Tiseo	NA
Natural gas	million cubic meters per day	Hellenic Petroleum S.A.	Prinos offshore gasfield and oilfield, east of Thasos Island	125
Do.	do.	Kavala Oil S.A. (Energean Oil and Gas S.A.)	South Kavala gasfield, east of Thasos Island	NA
Nickel, ore		Larco G.M.M. S.A. (Government, 55.2%; National Bank of Greece, 33.4%; Public Power Corporation, 11.4%)	Agios Ioannis Mine, Evia Mine, at Neo Kokkino near Larymna; and Kastoria Mine, near Albanian border	2,500
Do.		do.	Larymna smelter, near Athens	2,500
Nitrogen, N content of ammonia		Phosphoric Fertilizers S.A.	Nea Karvall	150

See footnotes at end of table.

TABLE 2—Continued
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Perlite		S&B Industrial Minerals, S.A. (Imerys S.A.)	Mines on Milos Islands; plant at Pireaus	650
Do.		Otavi Minen Hellas S.A. (Otavi Minen AG)	Milos Island	150
Petroleum, crude	42-gallon barrels per day	Kavala Oil S.A. (Energean Oil and Gas S.A.)	Prinos offshore oilfield, east of Thassos Island	NA
Petroleum, refined	do.	Hellenic Petroleum S.A.	Aspropyrgos	115,000
Do.	do.	do.	Eleusis	120,000
Do.	do.	do.	Thessaloniki	92,000
Do.	do.	Motor Oil (Hellas) Corinth Refineries S.A.	Aghii Theodori, Corinth	163,000
Pozzolan (Santorin earth)		Lava Mining and Quarrying Co. (Heracles General Cement Co.)	Xylokeratia, Milos Island	600
Do.		TITAN Cement Co. S.A. (TITAN Group)	do.	300
Pumice		Lava Mining and Quarrying Co. (Heracles General Cement Co.)	Yali Island	1,000
Quartz (microcrystalline)		do.	Adamas, Milos Island	150
Steel, crude		Hellenic Halyvourgia	Volos plant	1,000
Do.		Sidenor Steel Products Manufacturing S.A.	Thessaaloniki and Almyros plants	2,800
Do.		Halyvourgiki S. A.	Eleusis plant	1,200
Do.		Hellenic Steel Co. S. A.	Thessaloniki plant	1,000
Steel products		Corinth Pipeworks S.A. (CPW)	Thisvi plant, Viotia, nears Athens	800
Zinc, mine, Zn in concentrate		Hellas Gold S.A. (Eldorado Gold Corp.)	Kassandra Mines (Olympias and Stratoni), northeastern Chalkidiki	30

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF HUNGARY

By Sinan Hastorun

Hungary is a landlocked, largely lowland country in the southeastern part of Central Europe that borders the European Union (EU) member states of Austria, Croatia, Romania, Slovakia, and Slovenia, and Serbia and Ukraine, which are not EU states. The territory of Hungary lies in the central part of the Pannonian Basin, whose pre-Tertiary geologic structure is composed of coal-bearing formations, bauxite, and limestone. Although the country has about 80 different identified mineral deposits, only a limited amount of those mineral resources were extracted in 2014. Hungary historically was an important producer of bauxite, coal, copper, hydrocarbons, iron and steel, and uranium. The mineral industry's output and employment as well as its contribution to the national economy decreased substantially during the transition from a centrally planned to a free-market economy in the 1990s as many state-owned enterprises were either closed or downsized after being privatized. In 2014, bauxite mining ceased and copper and uranium mining remained nonexistent. Coal mining continued to decrease with the exception of lignite. Iron and steel production, however, reversed its recent decline. The mining of crude construction materials (including aggregates, crushed rock, dimension stone, gravel, and sand) and other industrial minerals (such as clays, diatomite, lime, peat, perlite, and quartzite) were sustained by the expansion of the construction sector (table 1; Haas, 2008, p. 34; 2015, p. 7; Katona and others, 2008, p. 139–142; Kiss, 2008, p. 157; Kocsis and Schweitzer, 2008, p. 9–12; György, 2011, p. 2; Mining Journal, 2014; Horváth, 2015, p. 3–5; Hungarian Central Statistical Office, 2015k; U.S. Department of State, 2015, p. 3).

In 2014, Hungary was estimated to be the fifth-ranked producer of perlite (mostly for use in construction) in the world and to have accounted for about 3% of global production. In terms of metallic minerals, alumina and aluminum were still being produced in the country, as was gallium as a byproduct of alumina refining, but at substantially lower levels than before owing to the recent decline of bauxite mining. Hungary accounted for less than 1% of the world's production of gallium, which was its share in previous years. Hungary continued to produce mineral fuels and related materials, but production continued to decrease and imports accounted for about 80% of the country's total energy consumption (Hungarian Central Statistical Office, 2015a; Bennett, 2016; Jaskula, 2016).

Minerals in the National Economy

Hungary's real gross domestic product (GDP) increased by 3.7% in 2014 compared with an increase of 1.1% in 2013 and almost reached the 2008 pre-economic crisis level. The nominal GDP was $138.4 billion in 2014. Growth was mainly owing to increased domestic demand, which contributed 4.0%, while net exports (exports minus imports) subtracted 0.4% from it. The increase in both public and private investment was in large part owing to the increased use of EU funds and the provision of subsidized loans by the Central Bank of Hungary to small- and medium-size enterprises; the increase in private consumption was primarily owing to increases in incomes resulting from decreases in utility prices mandated by the Government. All sectors of the economy, in particular industry (1.5%), contributed positively to economic growth (European Commission, 2015b, p. 98; Hungarian Central Statistical Office, 2015e, p. 2, 2015h; International Monetary Fund, 2015, p. 4).

The value of production by the mining and quarrying sector was HUF 99.4 billion ($410 million)[1] and accounted for 0.3% of the GDP in 2014, which was about the same percentage of the GDP as in 2013. The value of production by the base metals and fabricated metal products manufacturing (except machinery and equipment) was HUF1,775 billion ($7.3 billion) and accounted for 5.3% of the GDP, which was about the same as in 2013. The value of production by other nonmetallic mineral products manufacturing sector was HUF1,748 billion ($7.2 billion), accounting for 5.2% of the GDP, which was about the same as in 2013. The value of output by the coke and petroleum refinery products manufacturing sector was HUF1,608 billion (about $6.64 billion), accounting for 5.0% of the GDP in 2014 compared with 5.5% (revised) in 2013 (Hungarian Central Statistical Office, 2015h, i).

The value added to the GDP by the entire manufacturing sector accounted for 23.5% of the GDP in 2014 compared with 22.6% in 2013. The bulk of the industrial sector's added value had to do with assembling manufactured products for export. The value added to the GDP by the mining and quarrying sector was 0.2% in 2014, which was unchanged from 2013. The construction sector, whose value added was 4.4% in 2014, used at least some domestically produced construction materials (Hungarian Central Statistical Office, 2015g).

Industrial production increased by 7.7% by volume in 2014 after increasing by 1.1% in 2013. Mining and quarrying output decreased by 0.1% in 2014 compared with a decrease of 7.7% in the previous year. The production of base metals and fabricated metal products, except machinery and equipment, increased by 5.9% in 2014 compared with an increase of 0.7% in 2013; rubber and plastic products and other nonmetallic mineral products, by 5.0% (a decrease of 2.7% from 2013); and coke and refined petroleum products, by 1.0% (a decrease of 1.9% from 2013) (Hungarian Central Statistical Office, 2015j, k).

Government Policies and Programs

According to Sections 43 and 44 of the Act on Mining No. XLVIII, the Hungarian Office for Mining and Geology of the Ministry of National Development is the state entity that authorizes and regulates mineral exploration on open areas;

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[1] Where necessary, values have been converted from Hungarian forints (HUF) to U.S. dollars (US$) at an average rate of HUF242.08=US$1.00 for 2014 and HUF232.77=US$1.00 for 2013. All values are nominal, at current prices, unless otherwise stated.

exploration and extraction of mineral reserves after the establishment of mining land; use of waste heaps; exploration, establishment, and use of geologic structures suitable for natural gas storage; and extraction and utilization of geothermal energy. The Office also prepares the Ministry's decisions on mineral reserve management and concession contracts. All mineral commodities and geothermal energy belong to the state as long as they remain in their natural place of occurrence, but they become the property of the extractor upon extraction and utilization (Katona and Fodor, 1998; United Nations Department of Social and Economic Affairs, Division for Sustainable Development, 2009; Hungarian Office for Mining and Geology, 2013).

The Act XL of 2008 on natural gas supply was amended in November 2014. The amendment allows a company to construct natural gas transmission lines on the basis of a transmission line construction permit; as such, a transmission system operator permit is not required for such activity. Thereby, the construction of a natural gas pipeline no longer falls under the scope of the 10-year network development plans, and a company would need only the approval of the Hungarian Energy Office and not that of any other bodies, such as the European Commission (EC). The Commission had ruled previously that all bilateral intergovernmental agreements on the South Stream natural gas pipeline projects between the Government of Russia and EU member states were in breach of the EU Gas Directive of the Third Energy Package, which stipulated that pipeline operators could not also be natural gas extractors in order to preserve free competition in energy supply (Gotev, 2014; Varga, 2015, p. 101).

Production

Metal ore production continued to decrease in 2014, with the exception of manganese. Among metals, the production of bauxite and gallium decreased by about 85% each; alumina, by 25%; and aluminum, by 24%. The production of manganese ore increased by 44%. Iron and steel output increased in 2014 after decreasing in 2013. The production of crude steel increased by 31%, and pig iron, by 28%. The production of steel semimanufactures decreased by 6% (table 1).

Among industrial minerals, the production of sandstone increased by 65%; gravel, by 64%; zeolite, by 40%; dolomite, by 37%; foundry sand, by 21%; common sand, by 19%; ammonia, by 16%; hydraulic cement, by 14%; quartzite and limestone, by 13% each; silica sand, by 8%; and sulfuric acid, by 6%. The production of peat decreased by 42%. Among mineral fuels and related materials, natural gas output decreased by 6% and crude petroleum and brown coal, by 2% each. Lignite coal output increased by 1% (table 1).

Structure of the Mineral Industry

All major mineral producers were privately owned, with the exception of aluminum producer Magyar Aluminium Ltd. (MAL) and hydrocarbons producer Hungarian Oil and Gas Co. plc (MOL). MAL was nationalized in February 2013 following its bankruptcy in order to be liquidated. The Government continued to hold a 24.7% ownership interest in MOL as of June 2015. The state's role and ownership in the energy sector has increased substantially since 2013 through regulatory measures that mandated multiple decreases in household utility prices in 2013 and 2014, the acquisition of the gas distribution company Fogaz from RWE of Germany in April 2014, and the establishment of the state utility company ENKSz in 2015. Table 2 is a list of major mineral industry companies and facilities operating in 2014 (table 2; Budapest Times, The, 2013; European Bank for Reconstruction and Development, 2014; MOL Group, 2015c; U.S. Department of State, 2015, p. 8).

Mineral Trade

Hungary's exports were valued at $107.7 billion in 2014 compared with $95.2 billion (revised) in 2013. Its imports were valued at $104.2 billion in 2014 compared with $99.1 billion in the previous year. European countries accounted for 85.3% of Hungary's exports and 71.4% of its imports in 2014, and the EU accounted for 77.1% of exports and 59.2% of imports. In terms of both exports and imports, Germany by far had the largest shares, with 27.5% and 22.4%, respectively. The United States accounted for only 3.0% of Hungary's exports and 2.5% of its imports (Hungarian Central Statistical Office, 2015c, d).

In 2014, the value of Hungary's exports of mining and quarrying products was $75.9 million and accounted for about 0.1% of the total value of all exports. The value of exports of other nonmetallic mineral products was $4.73 billion and made up 4.4% of total exports; base metals and fabricated metal products, except machinery and equipment, $4.5 billion, or 4.2% of total exports; and coke and refined petroleum products, $2.29 billion, or 2.1% of total exports in 2014 (Hungarian Central Statistical Office, 2015b).

In 2014, Hungary's trade balance for crude materials (including nonfuel minerals) was $0.7 billion compared with $1.0 billion in 2013. For mineral fuels, related materials, and energy (including electricity), the trade balance was -$8.3 billion compared with -$8.5 billion in 2013. In 2014, the value of the country's exports of crude materials was HUF689.2 billion ($2.8 billion) and accounted for about 3% of the total value of all exports. The value of the country's exports of mineral fuels and related materials was HUF872.4 billion ($3.6 billion) and accounted for 5% of the total value of all exports. The value of the country's imports of crude materials was HUF519.6 billion ($2.1 billion) and accounted for 2% of the total value of all imports. The value of the country's imports of mineral fuels and related materials (including electricity) was HUF2,877.1 billion ($11.9 billion) and accounted for about 15% of the total value of all imports in 2014 (Hungarian Central Statistical Office, 2015a).

In 2014, Hungary's total exports to the United States were $5.3 billion, and its total imports from the United States were $1.8 billion. Hungary's mineral exports to the United States included, in order of value, bauxite and aluminum ($16.9 million); iron and steel advanced manufactures ($12.1 million); finished metal shapes ($6.8 million); fertilizers ($5.2 million); iron and steel products except advanced manufactures ($2.2 million); precious metals, except gold ($1.1 million); iron and steel mill products ($925,000); nonferrous metals ($596,000); petroleum products ($300,000); sulfur ($272,000); nuclear fuel materials ($193,000); and coal ($93,000). Hungary's mineral imports from the United States included, in order of value, finished metal shapes ($41.5 million); iron and steel products ($7.8 million); nonferrous metals ($4.5 million); iron and steel mill products ($1.9 million); fertilizers ($1.4 million); copper ($1.2 million); petroleum products ($711,000); aluminum and alumina ($486,000); and nuclear fuel materials ($181,000) (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Aluminum, Bauxite and Alumina, and Gallium.—Bauxite mining in Hungary ended in 2014. MAL, which had been the leading bauxite and alumina producer in the country, was in the process of liquidating its assets to comply with a court order issued in 2013 to pay off company creditors and others who had sued for damages as well as to pay substantial environmental fines that resulted from the collapse in October 2010 of a tailings dam maintained by the company. The collapse was considered the country's worst environmental accident. In July 2014, the Hungarian National Asset Management Company (MNV) initiated the sale of MAL's assets. The operation and management of the company had been taken over by the MNV in February 2013, which established a new company (Nemzeti-MAL-A Aluminiumtermelo) in April 2014 to take over the assets of MAL. The MNV had pledged initially to provide funds to maintain production at MAL and its suppliers. The company closed its Halimba bauxite mine in February 2013 owing to unprofitability and ceased processing its own bauxite (Budapest Times, The, 2013; MTI Econews, 2013; Rácz, 2013; Daily News Hungary, 2014).

Iron and Steel.—All crude steel output in Hungary remained continuous cast steel in 2014. In terms of the production process, 84.5% of crude steel was produced by oxygen-blown converters, while 15.5% of output was by electric furnaces (World Steel Association, 2015, p. 11, 17).

ISD Dunaferr Co. Ltd., which was a wholly owned subsidiary of the Industrial Union of Donbass (ISD) Corp. of Ukraine, was in the process of upgrading its hot-rolling mill and renovating its blast furnace. ISD Dunaferr, which was based in Dunaujvaros, was one of the largest industrial producers in the country. The objective of the investment was to increase the company's production of higher value-added products at both of the hot- and cold-rolling plants, specifically the manufacturing of galvanized steel and other coated products. In February 2014, ISD Corp. turned down an offer by the Government to acquire ISD Dunaferr and announced that it planned to turn ISD Dunaferr into the most competitive steelworks company in Central and Eastern Europe. The purchase offer had been made initially in September 2013 in order to maintain production and employment at the plant in response to the company's announced plans to downsize in August 2013 by laying off about 27% of its workforce. Layoffs were subsequently reduced from the originally planned 1,500 to 400 workers (Gulyas, 2013; Keszthelyi, 2014a; Landry, 2014a; Regional Today, 2014).

Industrial Minerals

Cement.—In 2014, the production of cement increased owing to a 14% increase in domestic construction activity. Multiple construction projects in transportation infrastructure, industrial buildings, and warehouse properties resulted in increased demand for cement in the country. Activity in the ground engineering sector increased by 23.1% and accounted for about 61% of construction projects in progress; this was in large part owing to new road and railway construction by the Government. The physical volume of output by the building construction sector increased by 10%. The residential sector output increased by 3%, but this followed a contraction of 15% in 2013 (Hungarian Central Statistical Office, 2015i; STRABAG SE, 2015, p. 92).

Lafarge Cement Magyarorszag Kft. operated the Kiralyegyhza integrated cement plant near Pecs and had an approximate market share of 20% in Hungary. The company had launched the plant in September 2011 in partnership with STRABAG SE of Austria as one of the newest greenfield plants in Central and Eastern Europe. In December 2014, Lafarge opened an alternative fuel warehouse at the Kiralyegyhza plant to store waste rubber, plastic, and industrial waste. STRABAG reported that production from its facilities in Hungary and Austria accounted for 27% of the cement and 28% of the concrete it used for its construction projects around the world in 2014. The company had a market share of 6.4% in Hungary's construction sector as a whole and a 10.1% share in road construction (Global Cement, 2014; International Cement Review, 2015, p. 165; STRABAG SE, 2015, p. 24, 92).

Holcim Ltd. of Switzerland ended cement production in Hungary in 2013 after it announced plans to permanently close its Labatlan wet-process cement plant in October 2012 partly owing to the downturn of the construction sector in the aftermath of the 2008 global economic crisis. Its Hungarian subsidiary, Holcim Magyarorszag Zrt., operated 16 batching plants. Holcim planned to sell its Hungarian unit in 2015 in order to meet regulatory conditions for its planned merger with Lafarge S.A. (Keszthelyi, 2014b; International Cement Review, 2015, p. 165).

Mineral Fuels and Related Materials

In 2013 (the latest year for which comprehensive data were available), Hungary's primary energy supply was provided by natural gas (33.9%), crude oil and petroleum products (25.6%), nuclear energy (17.6%), coal (11.9%), and renewable energy sources (8.4%). The country's energy production was supplied by nuclear energy (39.2%), renewable energy sources (20.6%), natural gas (14.7%), coal and lignite (15.7%), and crude oil and petroleum products (8.9%). Hungary was import dependent for about 56% of its energy needs, 78% of its natural gas consumption, 81% of its petroleum consumption, and 40% of its coal consumption. Russia was the largest source of the country's imports of crude petroleum (91%), natural gas (65%), and petroleum product imports (39%) (European Commission, 2014, p. 6, 8; International Energy Agency, 2014, p. 235, 240; European Commission, 2015a,

p. 121–122; 2015c, p. 7; Hungarian Central Statistical Office, 2015f; Than and Dunai, 2015).

Coal.—Lignite open pit production continued its recent upward trend in 2014, while brown coal production, which was the predominant segment of the coal sector until the early 1990s, continued to decrease. Bituminous coal production, which had decreased in the country since the early 1970s, had almost ceased in the mid–2000s and was very minor. Hungary's lignite output was about 8.9 million metric tons (Mt) in 2014, which was a slight increase from 8.8 Mt in 2013. Brown coal output was 734,000 metric tons (t) in 2014, which was a decrease from 747,000 t in the previous year; at its peak in 1964, brown coal output amounted to about 22.4 Mt. The total number of mining plots was 72, of which 30 were in suspended status (table 1; Horváth, 2015, p. 5, 15).

In December 2014, the Márkushegy underground mine, which is located in northwestern Hungary, was closed under EU rules because it was financially uncompetitive. The EC had authorized public funding in January 2013 to aid in the process of closing the Markushegy Mine by the end of 2014 to mitigate any social or environmental effects from the closure. The mine was the last major underground coal mine in the country and had accounted for about 10% of national coal output. As a result of the closure, the state-owned Magyar Villamos Muvek Zrt. planned to convert the Vertes powerplant, which had used coal from the Márkushegy Mine for electricity generation, into a biomass power plant with a built-in capacity of 108 megawatts (MW) (European Commission, 2013; Horváth, 2015, p. 15; Varga, 2015, p. 102).

Two opencast mines, Bükkábrány and Visonta, accounted for about 90% of Hungary´s coal production. The Bükkábrány Mine was the larger of the two and nationally more important in terms of output and electricity generation; it supplied the 880-MW-capacity Matrai Erömü powerplant, which is located in northeastern Hungary. In 2014, the Vasas coal mine, which is located near Pecs, was reopened for small-scale production in order to supply local households, but no production data were available. The reopening of the Vasas coal mine followed the reopening of the Farkaslyuk coal mine, which is located in northeastern Hungary, in the second half of 2013 after 20 years of being closed (Euracoal, 2013, p. 37; European Commission, 2013; Mining Journal, 2014, p. 23; Horváth, 2015, p. 15).

Natural Gas, Petroleum, and Petroleum Products.—Hungary's crude petroleum production decreased by 7.1% and its natural gas production decreased by 5.6% in 2014 as a result of natural depletion. The domestic extraction of crude petroleum had reached its peak in 1985 at about 64,000 barrels per day (bbl/d) and natural gas, in 1990 at 4.9 billion cubic meters, but they have fallen sharply since then. Domestic production of petroleum met about 13% of the country's petroleum demand, while that of natural gas accounted for about 24% of domestic consumption. In order to revitalize hydrocarbon exploration and extraction, the Government issued tenders in February 2014 and June 2014. Contracts were subsequently signed with six companies for eight hydrocarbon concession blocks and two geothermal concession blocks (table 1; Conybeare, 2014; International Energy Agency, 2014, p. 233, 240; Horváth, 2015, p. 4).

Hungary's refining industry supplied about 80% to 85% of domestic demand for oil products, with imports accounting for the remainder. The composition of production was gas and diesel oil (45%), motor gasoline (16%), naphtha (15%), and residual fuel oil (1%). Hungary's three refineries, which were all owned by MOL, produced sufficient amounts of diesel, gasoline, jet kerosene, and residual fuels to meet domestic consumption; demand exceeded production for only naphtha, liquefied petroleum gas (LPG), and ethane. Crude oil distillation was concentrated in the Duna refinery, which had a capacity of 165,000 bbl/d. The refinery's main products were benzene, ethylene, propylene, toluene, and xylenes. The Tisza refinery hydrofinished gas oil and produced ethyl tertio butyl ether (ETBE). The Zala refinery blew and blended bitumen (International Energy Agency, 2014, p. 235, 236; MOL Group, 2015d).

MOL continued to be the dominant hydrocarbons and refined petroleum products producer in Hungary with a 98% market share in crude oil and a 95% share in natural gas. The company reported average daily crude oil and condensate production of 10,900 barrels of oil equivalent (BOE) in 2014 compared with 11,500 BOE in 2013, which was a decrease of 5.2%, and average daily natural gas production of 26,000 BOE compared with 27,200 BOE in 2013, which was a decrease of 4%. The company's goal was to keep the production decline below 5% by developing resources from new exploration concessions. In 2014, MOL was awarded exploration licenses for the Szeged Basin West and Okany Eastern hydrocarbon concession blocks and the Jaszbereny geothermal block. The company also continued its unconventional exploration project in the Derecske basin (Horváth, 2015, p. 7, 10; MOL Group, 2015a, p. 27, 31, 61; 2015b).

TXM Exploration and Production LLC, which was a subsidiary of Falcon Oil & Gas Ltd. of Ireland, held a 35-year hydrocarbon production license in the Makó Trough, which formed a part of the greater Pannonian Basin of Central Europe. The license covered an area of approximately 1,000 square kilometers located in the Makó Trough and close to the MOL group-owned and operated Algyö field, which had produced approximately 220 million barrels of crude oil and 708 billion cubic meters of natural gas through 2014. In January 2014, Falcon began testing operations on the first of three planned exploration wells, Kútvölgy-1, to determine reservoir quality and gas productivity from the target Algyő formation. In May 2014, the company completed well-testing operations on Kútvölgy-1 and also spudded a second well, Besa-D-1. Falcon plugged and abandoned the former because production did not meet commercial rates, and focused on the latter. In July 2014, the company suspended the Besa-D-1 well after drilling reached 3 kilometers and encountered gas shows. The three well program was extended through December 31, 2014. In December, however, Falcom also plugged and abandoned the second well after production did not meet commercial rates (Falcon Oil & Gas Ltd., 2014; 2015, p. 8, 9, 11).

Wildhorse Energy Ltd. of Australia terminated the coal gasification project it was in the process of developing near Mecsek Hills, which is located near the city of Pecs in southwestern Hungary, in conjunction with its uranium extraction plans. Although the company intended to sell the coal gasification project to Linc Energy of Australia in February 2014, the deal was subsequently canceled (Landry, 2014b; World Nuclear Association, 2015).

Hungary was a participant in the proposed South Stream Pipeline project, which would transmit gas from Russia across the bed of the Black Sea to Bulgaria, then through Bulgaria and Serbia to Central Europe. In November 2014, the Government announced plans to begin the construction of its portion of the pipeline in 2015. Gazprom of Russia had stored up to 700 million cubic meters of gas in Hungary since 2013. In December 2014, however, the project was canceled by the Government of Russia in response to infringement proceedings initiated by the EC against Bulgaria regarding the South Stream project for breach of the EU Gas Directive on competitive energy markets. The Government considered joining the proposed alternative project, the Turkish Stream pipeline, which would transmit gas through Turkey (Gotev, 2014; Leifheit, 2014; Russia Today, 2014; Than and Dunai, 2015).

Uranium and Nuclear Energy.—Uranium had not been produced since 1997 when the Mecsek Hills Mine was closed owing to inefficiency of operations. The in situ resources at the Mecsek Hills deposits were about 26.8 Mt of uranium ore, whereas inferred resources were 15 Mt and indicated resources were 750,000 t. Demonstrated (measured plus indicated) and inferred resources were about 31,400 t of contained uranium. A total of 20,600 t of uranium was produced at Mecsek Hills at an average rate of recovery of 50% to 60% between 1956 and 1997. In June 2012, the Government decided to examine the feasibility study prepared by Wildhorse, which was awarded an exploration license for uranium at the site in 2006. The area covered by Wildhorse's 20-year exploration and extraction license near the city of Pecs was subsequently expanded to 355 square kilometers, which increased the Joint Ore Resources Committee (JORC)-compliant inferred resource to 30,000 t of contained uranium. In October 2014, however, the company stopped all exploration activities in Hungary and divested itself of the project, citing a lack of progress and high operational costs, to focus on its Golden Eagle uranium and vanadium project in the United States (MTI Econews, 2012; Interactive Investor, 2014; Horváth, 2015, p. 14; Varga, 2015, p. 102; World Nuclear Association, 2015).

Hungary operated four nuclear reactors at the country's sole nuclear powerplant, the Paks Nuclear Power Plant, which had an electricity-generating capacity of 2 gigawatts and accounted for about 42% of the country's electricity generation. All nuclear fuel supply was contracted from TVEL of Russia. In November 2014, Paks Unit 2's operating license was extended by 20 years. The official target was to increase the share of nuclear energy in national electricity generation to about 60% by increasing nuclear capacity. In January 2014, the Government granted Rosatom State Atomic Energy Corp. of Russia the right to build two new nuclear reactors with a capacity of 1,200 MW each, which would increase the capacity of the Paks Power Plant from 2,000 MW to 2,400 MW. The first new unit was expected to be operational by about 2023. Nuclear fuel for the plant was to be supplied solely by Rosatom (World Nuclear News, 2014; U.S. Department of State, 2015, p. 3; Varga, 2015, p. 101; World Nuclear Association, 2015).

Outlook

Hungary's production of alumina, aluminum, and gallium is expected to continue to decrease owing to the end of bauxite mining in the country in 2014. Metal output levels will be largely determined by whether MAL's facilities and mines are kept in operation or dismantled following the company's liquidation. The production of crude steel and manufactures is expected to increase with Dunaferr's ongoing plant modernization. Coal output levels will decrease with the closing of the Márkushegy Mine in 2014; the production by newly reopened mines is likely to remain low in the near future and not make up the loss of output from Márkushegy. The production of cement and other construction materials may continue to increase if the Government continues to budget more stimulus funds for the sector. Crude petroleum and natural gas outputs in Hungary are projected to decrease further, although MOL's new wells may reduce the rate of decline. The new exploration licenses granted by the Government in the two bidding rounds are not expected to result in increased hydrocarbon extraction in the near future. No petroleum production is expected to materialize at the Makó Trough following Falcon's decision to end drilling in the country. Uranium production is likely to remain nonexistent after Wildhorse's termination of its Mecsek Hills project in 2014.

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TABLE 1
HUNGARY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Alumina, gross weight, calcined basis		214	165 [e]	110	81	61
Aluminum, unwrought, including secondary		234	185 [e]	234	62	47
Bauxite, gross weight		171 [r]	155 [r]	144 [r]	52 [r]	8
Gallium[e]	kilograms	4,000	5,000	4,600	1,713 [3]	260
Iron and steel, metal:						
Pig iron		1,325	1,317	1,229	628	801
Steel:						
Crude		1,678	1,746	1,542 [r]	883	1,152
Semimanufactures		1,594	1,765	1,928	1,936 [r]	1,823
Manganese ore, run-of-mine:						
Gross weight		158 [r]	167 [r]	147 [r]	100 [r]	144
Mn content		14	15	13	9	13
INDUSTRIAL MINERALS						
Alginite	cubic meters	590 [r]	1,020 [r]	1,914	2,719	2,706
Ammonia		NA	NA	NA	359 [3]	417 [3]
Cement, hydraulic[e]		2,100	1,950 [r]	1,770 [r]	2,415 [r, 3]	2,750
Clays:						
Bentonite, raw		6 [r]	7 [r]	1 [r]	3 [r]	6
Chamotte, refractory clays		82	86	80 [e]	64 [e]	70 [e]
Kaolin, beneficiated		239	248	250 [e]	310 [e, r]	320 [e]
Other, unspecified		1,271	1,780 [e]	1,170 [e]	870 [e, r]	900 [e]
Diatomite	metric tons	2,490	1,309	1,229 [r, 3]	434	450 [e]
Gypsum and anhydrite	do.	2,560	--	--	--	--
Lime, calcined		260	250	230	250 [e, r]	250 [e]
Nitrogen, N content of ammonia[e]		300	300	300	300	300
Paludal mud	cubic meters	NA	NA	28,000 [3]	19,974 [3]	19,000 [e]
Peat, agricultural use[3]		70 [r]	100 [r]	82 [r]	119 [r]	69
Perlite	cubic meters	34 [r]	34 [r]	35 [r]	31 [r]	33
Quartzite	do.	380 [r]	188 [r]	123 [r]	507 [r]	571
Sand and gravel:						
Gravel		17,525 [r]	16,440 [r]	14,689 [r]	17,622 [r]	28,886
Sand:						
Common		6,877 [r]	5,741 [r]	5,595 [r]	6,806 [r]	8,078
Foundry		121 [r]	123 [r]	56 [r]	52 [r]	63
Glass (silica)		271	287	124 [e]	353 [r, 3]	382 [3]
Stone:						
Dimension, all types		9,810	8,870	8,600	8,330 [r]	8,400 [e]
Dolomite		5,375 [r]	4,958 [r]	4,105 [r]	4,877 [r]	6,689
Limestone		7,468 [r]	6,047 [r]	5,834 [r]	6,022 [r]	6,789
Marl		23 [r]	48 [r]	52 [r]	3 [r]	3
Sandstone	metric tons	30,190 [r]	16,266 [r]	10,909 [r]	22,723 [r]	37,452
Sulfur, byproduct, elemental, all sources[e]		60	60	60	60	60
Sulfuric acid[e]		75	75	75	63 [r, 3]	67 [3]
Zeolites	cubic meters	17,084	13,947	15,467	14,135	19,712
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Brown		910	755	859	747 [r, 3]	734 [3]
Lignite		8,203	8,800	8,438	8,834	8,918 [3]
Total		9,113	9,555	9,297	9,581 [r]	9,652
Coke, metallurgical[e]		1,100	820	870	853 [r]	862
Gas, natural, net (marketable)	million cubic meters	3,036 [r]	2,667	2,286 [r]	2,065 [r, 3]	1,934 [3]
Petroleum:						
Carbon black		--	3,000	--	--	--
Crude[4]	thousand 42-gallon barrels	4,613 [r]	4,200 [r]	4,144 [r]	3,817 [r]	3,735

See footnotes at end of table.

TABLE 1—Continued

HUNGARY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
MINERAL FUELS AND RELATED MATERIALS—Continued						
Petroleum—Continued:						
Refinery:[4, e]						
Motor fuel (including aviation fuel)	do.	10,700	11,200	12,000	10,950 [r]	10,300
Distillate fuels	do.	8,760	9,200	9,870	9,700 [r]	9,100
Kerosene	do.	1,760	1,850	1,980	1,340 [r]	1,450
Gas oils	do.	28,800	30,200	32,400	30,200 [r]	31,100
Other fuel oils	do.	367	385	414	378	380
Lubricating oils	do.	1,190	1,250	1,340	1,100 [r]	1,200
Liquefied propane and butane	do.	2,500	2,630	2,820	3,210 [r]	2,800
Petroleum jelly, paraffin wax, and other waxes	do.	328	344	370	358 [r]	370
Petroleum coke, bitumen, and residues	do.	5,120	5,380	5,770	5,262	5,300
Total	do.	59,500	62,400	67,000	62,500 [r]	62,300

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA. Not available. -- Zero.

[1] Table includes data available through November 18, 2015.

[2] In addition to the commodities listed, talc, urea, and a variety of other industrial minerals and construction materials may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Data before 2011 may include production of alginite and (or) paludal materials (including paludal mud).

[4] Figures were converted to thousand 42-gallon barrels from production reported in thousand metric tons at a rate of 6.29 42-gallon barrels per metric ton.

TABLE 2
HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity holders	Location of main facilities	Annual capacity
Alumina	Magyar Aluminium Ltd. (MAL)	Ajka Timfoldgyar plant, about 120 kilometers southwest of Budapest, near Lake Balaton	400
Alumina, fused	Motim Electrocorundum Ltd.	Plant at Mosanmagyarovar	50
Aluminum	Alcoa-Köfém Kft (Alcoa Inc., 100%)	Székesfehérvár ingot plant.	NA
Bauxite	Magyar Aluminium Ltd. (MAL)	Bakony and Halimba Mines,[1] 5 kilometers south of Ajka, northwestern Hungary	NA
Bentonite	Bentonit Hungaria Kft (S&B Industrial Minerals S.A., 100%)	Mines and plant at Egyhazaskeszo	NA
Cement	Duna-Drava Cement Kft. (HeidelbergCement AG, 50%; Schwenk Zement KG, 50%)	Plants at Beremend, 30 kilometers south of Pecs, and Vac, 35 kilometers north of Budapest	2,800
Do.	Holcim Magyarorszag Zrt. (Holcim Ltd.)[2]	Plant at Labatlan	300
Do.	Lafarge Cement Magyarorszag Kft. (Lafarge S.A., 70%; STRABAG SE, 30%)	NOSTRA plant at Kiralyegyhaza, southwestern Hungary	1,000
Clays	Agyag-Asvany Kft.	Two opencast mines at Felsopeteny	NA
Coal:			
Brown coal	Vertes Power Plant Ltd. (Magyar Villamos Muvek Zrt., 96.59%)[3]	Markushegy Mine at Oroszlany, 55 kilometers west of Budapest	1,400 [e]
Do.	NA	Bakonyoszlop Mine in Veszprem	NA
Do.	NA	Farkaslyuk Mine in Borsod-Abauj-Zemplen	NA
Lignite	Mátrai Erömü Zrt. (MÁTRA) (RWE AG, 50.9%; Magyar Villamos Muvek Zrt., 25.5%; EnBW AG, 21.7%)	Thorez opencast mine at Visonta, 80 kilometers northeast of Budapest	4,700 [e]
Do.	do.	Opencast mine at Bukkabrany, 130 kilometers northeast of Budapest	4,000 [e]
Do.	NA	Vasas opencast mine in Pecs	NA
Coke	ISD Kokszolo Ltd. (ISD Dunaferr Co. Ltd.)	Dunaujvaros, 60 kilometers south of Budapest	1,000
Iron, pig iron	ISD Dunaferr Co. Ltd. (Industrial Union of Donbass Corp.)	do.	1,400
Manganese	Mangán Mining and Processing Ltd.	Úrkút manganese ore mines, 120 kilometers southwest of Budapest	NA
Natural gas	Hungarian Oil and Gas Co. plc. (MOL) (Foreign investors, 25.1%; Government, 24.7%; CEZ MH B.V., 7.3%; OmanOil Ltd., 7.0%; others, 35.9%)	Oil and gas fields in southern and southwestern Hungary	NA
Perlite	Perlit 92 Kft	Palhaza, northeastern Hungary; opencast mine and processing plant	NA
Petroleum:			
Crude 42-gallon barrels per day	Hungarian Oil and Gas Co. plc. (MOL) (Foreign investors, 25.1%; Government, 24.7%; CEZ MH B.V., 7.3%; OmanOil Ltd., 7.0%; others, 35.9%)	Oil and gas fields in southern and southwestern Hungary	14,800 [e]
Refined do.	Duna Refinery [Hungarian Oil and Gas Co. plc. (MOL), 100%]	Szazhalombatta, 25 kilometers southwest of Budapest	165,000
Do.	Tisza Refinery [Hungarian Oil and Gas Co. plc. (MOL), 100%]	Tiszaújváros in northeastern Hungary	NA
Do.	Zala Refinery [Hungarian Oil and Gas Co. plc. (MOL), 100%]	Zalaegerszeg in western Hungary	NA
Pig iron	ISD Dunaferr Co. Ltd. (Industrial Union of Donbass)	Dunaujvaros, 60 kilometers south of Budapest	1,300
Silica	Uveg-Asvany Banyaszati Ipari Kft.	Mine and plant at Fehevaresugo	NA
Steel, crude:			
Primary	ISD Dunaferr Co. Ltd. (Industrial Union of Donbass)	Dunaujvaros, 60 kilometers south of Budapest	1,600
Secondary	OAM OZD Steelworks Ltd.	120 kilometers northeast of Budapest	360
Do.	Dam 2004 Acel-es Hengermu Kereskedemi es Szolgaltato Ltd.	Diosgyor, 145 kilometers northeast of Budapest	550

[e] Estimated. Do., do. Ditto. NA Not available.

[1] Halimba Mine was closed in February 2013.

[2] Stopped production in October 2012.

[3] Closed in December 2014.

THE MINERAL INDUSTRY OF ICELAND

By Alberto Alexander Perez

Iceland has no proven base metal, precious metal, or mineral fuel reserves. It has some industrial mineral resources, including salt and pumice, but, overall, Iceland depends on imports to meet domestic demand for most mineral commodities. Iceland has abundant hydropower and geothermal resources, which makes the country an economically attractive location for power-intensive smelter operations. In 2014, the country accounted for about 1.6% of global production of primary aluminum and about 1.0% of global production of ferrosilicon (Bray, 2016; Schnebele, 2016).

Minerals in the National Economy

The nation's real gross domestic product (GDP) increased to $14.86 billion in 2014, or by 1.9% compared with that of 2013. Mineral-related production played a significant role in the national economy. In 2014, the value of basic metals accounted for 30.1% of the total value of production in the country, second only to food products and beverages (51.3%). In 2014, the country exported 844,721 metric tons (t) of aluminum and 112,657 t of ferrosilicon, which accounted for 39.5% of the total value of the country's exported goods. Imports of aluminum ores and concentrates amounted to 1,583,285 t and accounted for 9.2% of the value of the country's imported goods. The aluminum and ferrosilicon industries consumed 74.3% of the total electricity generated in the country (International Monetary Fund, 2015, p. 51; Statistics Iceland, 2015a–c).

In early 2014, Statoil ASA of Norway, Eni S.p.A. of Italy, GDF Suez S.A. of France, Det norske oljeselskap ASA of Norway, and Repsol S.A. of Spain began exploration drilling in the Barents Sea, although it was still unclear if the region could become as significant a hydrocarbon-producing region as the North Sea has proved to be. Statoil's discovery of up to 63 million barrels of recoverable oil equivalent at the Drivis prospect in 2014 may lead to development of the Johan Castberg area. In 2014, China National Offshore Oil Corp. (CNOOC) of China took a 60% stake in license No. 2014/01, which covers the area between Iceland and Norway's Jan Mayen Island. With this action, CNOOC was positioned to become the first Chinese company to explore for oil in the Arctic region. CNOOC was partnering with Iceland's Eykon Energy (15%) and Petoro Iceland (25%) (Mainwaring, 2014).

Government Policies and Programs

The laws applicable to the mineral industry include the Act on Survey and Utilization of Ground Resources, No. 57/1998, and the Electricity Act, No. 65/2003. Activities related to the survey and use of land are also subject to the Nature Conservation Act, Planning and Building Act, and other acts. Orkustofnun (the National Energy Authority under the Ministry of Industry and Innovation) is responsible for granting licenses and regulating compliance related to mineral exploration, prospecting, and extraction operations based on relevant laws pertaining to natural resources, the environment, hydrocarbons, and electricity (Orkustofnun, 2014c).

Production

Aluminum was Iceland's leading mineral commodity, followed by ferrosilicon. In 2014, the estimated production of aluminum increased by 9.2%. The production of cement had likely ceased in 2012 when Sementsverksmidja Rikisins (the only producer in the country) was converted to an importation and distribution company when production ceased at its facility in Akranes. The country's domestically produced industrial minerals included crushed stone, pumice, salt, sand and gravel, and scoria (tables 1, 2; Cement Ltd., 2014).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Aluminum.—Iceland started aluminum production in 1969. Since then, the production capacity had been gradually increasing owing to the competitive price of electricity in the country. In 2014, three aluminum smelting plants were in operation in Iceland. They were Alcoa Inc. of the United States Fjaroaal smelter at Reydarfjordur [344,000-metric-ton-per-year (t/yr) capacity]; Century Aluminum Co. of the United States smelter at Grundartangi (260,000-t/yr capacity); and Rio Tinto Alcan of Canada's Reykjavik [ISAL] smelter at Straumsvik (200,000 t/yr capacity). The aluminum industry had become less profitable in recent years, making the Government eager to attract other industries that could take advantage of its abundant energy resources (Katz, 2013; Association of Aluminum Producers in Iceland, 2014; Alcoa Inc., 2015, p. 12; Century Aluminum, 2015a; Rio Tinto plc, 2015, p. 230).

Silicon.—Elkem Iceland was established in 1975. The company had the capacity to produce 120,000 t/yr of ferrosilicon, and it consumed about 945 gigawatthours per year of energy. About one-third of the ferrosilicon output was used to produce magnesium ferrosilicon products; the plant also produced refined metal with reduced aluminum and carbon content. Elkem reduced production to 90% in February 2014 and planned to idle one of the three furnaces by April owing to the low water levels at the powerplant reservoirs. As a result, the production of ferrosilicon declined in 2014. Two new silicon facilities were in the process of obtaining the required permits in 2013—a 32,000-t/yr-capacity project in Husavik by PCC Group of Germany and a 16,000-t/yr-capacity project in Grundartangi by Silicor Materials Inc. of the United States. Both facilities were scheduled to come online in 2016 (table 2; PCC Group, 2014; Silicor Materials Inc., 2014).

Industrial Minerals

Pumice.—Jardefnaidnadur ehf (JEI) mined pumice in the Mount Hekla region about 100 kilometers from Reykjavik. JEI's main export markets were Belgium, Denmark, the Netherlands, and the United States (Jardefnaidnadur ehf, 2015; Statistics Iceland, 2015a).

Mineral Fuels and Other Sources of Energy

Petroleum.—In December 2014, the Icelandic National Energy Authority, Orkustofnun, received notification from Faroe Petroleum and its partners Petoro Iceland and Iceland Petroleum that they had relinquished their license No. 2013/01, which was issued on January 4, 2013. The results of Faroe Petroleum's initial studies of the licensed area suggested that seismic data in the next phase of exploration would be inconclusive owing to the presence of basalts on the eastern edge of the Dreki area, which would complicate the imaging of sediment sequences below. The company stated that alternative exploration methods, excluding drilling, were evaluated by the joint-venture partners and were assessed as not significantly increasing the probability of identifying hydrocarbon-bearing structures in the IS2013/01 license area. Other license holders in the Dreki area appeared to be continuing with explorations as planned (Orkustofnun, 2014b).

Renewable Energy.—Iceland was at the forefront in the use of renewable energy resources, and it had one of the largest potential sources of renewable energy in the world. In 2013, the total primary energy used in Iceland was 278 gigawatthours. About 86% of the energy supply was from domestic geothermal and hydropower resources; the rest was from imported coal and oil. The installed power-generation capacity of the country was 2,767 megawatts (MW), of which 1,986 MW was hydropower and 665 MW was geothermal, together accounting for 95.5% of the total. The country had 51 hydropower plants, of which the largest was the Fljotsdalsvirkjun plant (690 MW). The country had seven geothermal powerplants, of which the largest was the Hellisheidi plant (303 MW) (Orkustofnun, 2014a, p. 3–5, 13).

Outlook

Aluminum production is expected to remain steady or to increase, depending on the terms of future energy contracts between the aluminum companies and the Government of Iceland—specifically, the tax imposed on large energy consumers. Century Aluminum's Helguvik smelter project is expected to increase Iceland's aluminum production capacity by 45% by 2020 if a long-term power supply contract can be secured in 2015. Implementation of new silicon projects in a few years would help the country diversify the use of its hydroelectric and geothermal power. Petroleum exploration is expected to continue offshore of Iceland (Elkem Iceland, 2014; Mainwaring, 2014; Century Aluminum, 2015b).

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TABLE 1
ICELAND: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons)

Commodity	2010	2011	2012	2013	2014
Aluminum, metal, primary[3]	825,803	780,853	802,827	736,429	800,000 e
Cement, hydraulic	140,000	142,000	146,000 r	-- r	--
Ferrosilicon	114,231	120,076	115,000 r	125,204	118,000 e

eEstimated data are rounded to no more than three significant digits. rRevised. -- Zero.

[1] Table includes data available through June 24, 2015.

[2] In addition to the commodities listed, other materials were thought to be produced, including pumice, salt, sand and gravel, scoria, and crushed stone; however, information was inadequate to make reliable estimates of output.

[3] Ingot and rolling billet production.

TABLE 2
ICELAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum	Alcoa Inc.	Fjaroaal smelter at Reydarfjordur	344
Do.	Reykjavik [ISAL] (Rio Tinto Alcan, 100%)	Straumsvik	200
Do.	Century Aluminum Co.	Grundartangi	260
Cement	Sementsverksmidja Rikisins (Government, 100%)[1]	Akranes	--
Ferrosilicon	Elkem Iceland (Elkem A/S)	Plant at Grundartangi	120
Pumice	Jardefnaidnadur ehf	Mount Hekla	285
Do.	BM Valla Ltd.	do.	32

Do., do. Ditto. -- Zero.

[1] The company was converted to an importation and distribution business in 2012.

THE MINERAL INDUSTRY OF IRELAND

By Alberto Alexander Perez

Ireland is part of the European Union (EU) and a member of the European Monetary Union, which uses the euro (EUR) as its official currency. In 2014, Ireland's nominal gross domestic product (GDP) was $245.9 billion compared with $232 billion (revised) in 2013, which was an increase of about 5.6%. The unemployment rate in Ireland decreased to 10.1% in January 2015 from 12.2% in January 2014—a decrease of 2.1% in 1 year (Central Statistics Office, 2015b; The World Bank, 2015).

In 2014, the total value of Ireland's exports was $118.48 billion,[1] which was an increase of 2.5% compared with that of 2013. The most significant exports, by value, were industrial products (accounted for 91% of the value), agricultural produce (7.4%), and forestry and fishing products (0.8%), with the remainder being other unclassified exports. The value of Ireland's imports in 2014 was $71.5 billion, which was an increase of 7.5% compared with that of 2013. Intra-EU trade accounted for 52% of Ireland's total exports, and the United States was the principal non-EU destination for products from Ireland, accounting for 23%. The most significant increase in imports was in machinery and transport equipment, which increased in value by 24%. By May 2014, the EU accounted for 62% of all imports, by value; of these, 29% originated from the United Kingdom. The United States accounted for 11% of Ireland's imports, and China, for 5%, by value (Central Statistics Office, 2015a).

Ireland was the principal zinc producer in the EU and was a major producer of lead in the world. Ireland was ranked 10th in the world (by tonnage of output) in the mine production of zinc and 12th in mine production of lead (table 1; Department of Communications, Energy and Natural Resources, 2014, p. 1; Guberman, 2016; Tolcin, 2016).

Minerals in the National Economy

According to an assessment report of the economic contribution of mineral exploration and mining in Ireland commissioned by Ireland's Department of Communications, Energy and Natural Resources in July 2013, the 2012 gross value-added contribution of the mining industry to Ireland's GDP was $350 million, with economy-wide expenditures by the industry of $1.03 billion. During the same period, Ireland employed 1,373 people directly in the mining industry, and the economy-wide employment supported by the industry was calculated to be 3,306 people (Indecon International Economic Consultants, 2013, p. 8–10, 50).

Production

In 2014, Ireland produced 1.951 million metric tons (Mt) of alumina, which was about the same as in 2013. Mine production of lead decreased by about 4.7%, and zinc production decreased by 13.5%.These and other production data are in table 1.

Structure of the Mineral Industry

Although Ireland was a major producer of lead and zinc in the EU, the mining and mineral-processing industry contributed only a small percentage to the country's GDP. Companies in the mining sector were privately owned, although the Irish Government owned about 60% of all mineral deposits and reserved the right of 100% ownership of any existing gold and silver deposits. The Exploration and Mining Division of the Department of Communications, Energy and Natural Resources is responsible for both the technical management of the state mineral licensing and leasing system and for promoting the mineral industry (Department of Communications, Energy and Natural Resources, 2013).

In 2014, three mining projects were operating in Ireland: the Tara lead and zinc mine in Navan, Co. Meath; the Lisheen lead and zinc mine in Co. Tipperary; and the gypsum operation with adjacent mines in Drummond and Knocknacran in Co. Monaghan. The Tara lead and zinc mine was owned by Boliden Tara Mines Ltd. (a subsidiary of Boliden AB of Sweden) and was the leading zinc mine, by tonnage of production, in the EU. The Lisheen lead and zinc mine was owned by Vedanta Resources plc of the United Kingdom, and the Drummond and Knocknacran gypsum mines were owned by Irish Gypsum Ltd. (a subsidiary of Saint Gobain Group of France) (table 2; Department of Communications, Energy and Natural Resources, 2014).

CRH plc. was an international building materials conglomerate based in Dublin. The company owned three subsidiaries in Ireland that produced construction aggregates, cement, lime, and limestone for domestic consumption and export.

Premier Periclase Ltd. (wholly owned by RHI AG of Austria) produced seawater magnesia products at its plant in Drogheda, Co. Louth. Sandvik Hyperion AB of Sweden and Element Six Ltd. (100% owned by De Beers Group of Luxembourg) produced industrial diamond and industrial abrasives in Ireland. The country's major mineral industry facilities and their capacities are listed in table 2.

Commodity Review

Metals

Bauxite and Alumina.—In 2014, United Company RUSAL (RUSAL) of Russia stated that it was close to completing a project that would switch the main energy source at its alumina refinery in Ireland from heavy fuel oil to gas. The existing oil-fired boilers would be replaced with two steam generators capable of producing 300 metric tons per hour of high-pressure superheated steam. The steam generators were scheduled to begin production in May; the savings were calculated to be $12 per ton of production. RUSAL also reported that its alumina plant was producing at 98% of nameplate capacity, which was its historical maximum production. The refinery was located on Aughinish Island on the south side of the Shannon estuary, near Limerick City, and was operated by Aughinish Alumina plc. In June, the Russian News Agency TASS reported that RUSAL had pledged 75% of the plant's production to Glencore as collateral for alumina production supplies that were to be delivered from 2014 through 2016. This credit agreement included a $400 million prepayment clause and was provided at the Libor rate plus 4.95% to be redeemed before the end of 2016 (Russian News Agency TASS, 2014; United Company RUSAL, 2014; 2015, p. 33).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.7527=US$1.00.

Lead and Zinc.—In 2014, Boliden's Tara Mine had Joint Ore Reserves Committee (JORC)-classified ore reserves (proven and probable) of 13.1 Mt grading 7% zinc and 1.6% lead. The mine employed 667 people in 2014 (Boliden AB, 2014, p. 41; Department of Communications, Energy and Natural Resources, 2014, p. 1).

In 2013, Vedanta Resources plc (Vedanta), which owned the Lisheen Mine, stated that it had successfully enacted a plan to close the mine by 2014 or 2015; however, no further details were announced in 2014. Vedanta produced 1.32 Mt of ore grading 11.52% zinc and 1.6% lead. This produced 259,000 t of zinc concentrate with 53.6% zinc content and 23,000 metric tons (t) of lead concentrate with 61.1% lead content. The last resource and reserve statement issued by Vedanta, dated March 2014, stated that the remaining reserves amounted to 1.67 Mt grading 10.46% zinc and 1.72% lead, with additional resources of 2.07 Mt grading 14.26% zinc and 2.40% lead (Department of Communications, Energy and Natural Resources, 2014, p. 1; Vedanta Resources Plc., 2014, p. 53).

Industrial Minerals

Cement.—Irish Cement Ltd. (wholly owned by CRH plc.) had cement operations in Limerick and in Platin, Co. Meath. The plant in Limerick had a kiln with a capacity of 800,000 metric tons per year, and the plant in Platin had a capacity of 2.8 million metric tons per year (Irish Cement Ltd., 2014a, b).

Gypsum.—Irish Gypsum extracted gypsum from two sites in southern Co. Monaghan. The company stated that it had extracted more than 200,000 t of gypsum in 2013, and production remained about the same in 2014. The continuing inactivity of the construction sector in Ireland was the most probable cause for the decrease in gypsum production since 2012 (Department of Communications, Energy and Natural Resources, 2014, p. 1).

Magnesium Compounds (Magnesia).—Premier Periclase produced a range of crystal sinter magnesia products and a range of magnesium oxide and magnesium hydroxide products and suspensions at its plant in Drogheda (Premier Periclase Ltd., 2014).

Outlook

Ireland's economy increased by 5.6% in 2014 compared with that of 2013, and it was expected to continue to increase in 2015. The construction sector, however, is recovering slowly, and it is likely that this will affect the production of construction materials, such as cement and gypsum.

The projected closure of the Lisheen Mine would significantly reduce lead and zinc production in the country. Vedanta Resources had not issued any further statements about its plans for the mine other than those published in its 2013 annual report.

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TABLE 1
IRELAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Alumina		1,864	1,926	1,927 [3]	1,935 [3]	1,951
Lead:						
Mine output, Pb content	metric tons	39,100	50,700	47,000 [3]	43,000 [3]	41,000
Metal, refined, secondary[e]	do.	19,000	18,000	18,000	18,000	17,000
Silver, mine output, Ag content	kilograms	3,818	6,109	6,000	5,800 [e]	5,800 [e]
Zinc, mine output, Zn content	metric tons	342,500	344,000	337,500 [3]	327,000 [3]	283,000
INDUSTRIAL MINERALS						
Cement, hydraulic[e]		2,379	2,103	2,200	2,000	2,000
Gypsum[e]		300	300	300 [3]	210 [3]	210
Sand and gravel[e, 4]		10,000	7,000	7,000	7,000	7,000
Stone and other quarry products, other[e, 5]	metric tons	40,000	25,000	25,000	25,000	25,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural, marketed	million cubic meters	402	356	350	459 [3]	460 [e]
Peat:[e, 6]						
For horticultural use		500	500	500	400	400
For fuel use, milled peat[7]		4,991	3,707 [3]	3,700	3,700	3,700
Total		5,500	4,200	4,200	4,100	4,100
Briquets		238	192 [3]	190	190	190
Petroleum refinery products:[8]						
Liquefied petroleum gas	thousand 42-gallon barrels	482	566	840	730 [r]	730 [e]
Naphtha[e]	do.	237 [3]	144 [3]	140	140	140 [e]
Gasoline, motor	do.	3,996	4,360	4,636	4,380 [r]	4,300 [e]
Distillate fuel oil	do.	9,616	9,481	8,906	8,395 [r]	8,400 [e]
Residual fuel oil	do.	8,154	8,991	6,205	6,200 [r]	6,200 [e]
Refinery fuel and losses	do.	980	752	750	750	750 [e]
Total[e]	do.	23,465	24,294	21,500 [e]	20,600 [e, r]	20,500 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto.

[1] Table includes data available through July 7, 2015.

[2] In addition to the commodities listed, Ireland also produced lime, limestone, seawater magnesia, and significant quantities of synthetic diamond, but production is not quantitatively reported on a regular basis, and available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Excludes output by local authorities and road contractors.

[5] Includes clays for cement production, fire clay, granite, marble, rock sand, silica rock, and slate.

[6] Includes production by farmers and by the Bord Na Mona (Government Peat Board).

[7] Includes milled peat used for briquet production.

[8] From imported crude oil.

TABLE 2
IRELAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facility	Annual capacity
Aggregates	Roadstone Wood Ltd. (CRH plc., 100%)	Tallaght, South Dublin	**10,600**
Alumina	Aughinish Alumina plc (United Company RUSAL, 100%)	Aughinish Island, Co. Limerick	**1,990**
Cement	Irish Cement Ltd. (CRH plc., 100%)	Plants in Limerick and Co. Meath	**3,500**
Diamond, industrial	Element Six Ltd. (De Beers Group, 100%)	Shannon, Co. Clare	**NA**
Gypsum	Irish Gypsum Ltd. (Saint Gobain Group 100%)	Mines in Drummond and Knocknacran, Co. Monaghan	**NA**
Lead-zinc, concentrate	Vedanta Lisheen Mining Ltd. (Vedanta Resources plc., 100%)	Lisheen Mine, Co. Tipperary	**187**
Do.	Boliden Tara Mines Ltd. (Boliden AB, 100%)	Tara Mine, Navan, Co. Meath	**215**
Lime	Clogrennane Lime Ltd. (CRH plc., 100%)	Plants in Co. Carlow and Co. Clare	**500**
Limestone	Roadstone Wood Ltd. (CRH plc., 100%)	Tallaght, South Dublin	**NA**
Magnesia	Premier Periclase Ltd. (RHI Group, 100%)	Drogheda, Co. Louth	**73**
Natural gas million cubic meters	Kinsale Energy Ltd. [Petroliam Nasional Berhad (PETRONAS), 100%]	Kinsale Head field, Celtic Sea	**2,100**
Peat	Bord Na Mona (Government Peat Board)	Production mainly in the Midlands	**4,200**
Petroleum, refined 42-gallon barrels per day	ConocoPhillips Whitegate Refinery Ltd.	Whitegate, near Cork	**71,000**

Do. Ditto. NA Not available.

The Mineral Industry of Italy

By Alberto Alexander Perez

Italy's gross domestic product (GDP), measured at market prices, was $2.14 trillion in 2014 compared with $2.13 trillion (revised) in 2013, and the country's GDP increased by 0.4% compared with that of the previous year. For 2014, the country reported an employment rate of 55.7% and an inflation rate of 0.2%. The country's budget deficit for 2014 amounted to 3% of the GDP and its national debt was equivalent to 132.1% of the GDP, making Italy the second-most indebted country in the European Union (EU), after Greece. Italy, however, ranked fourth in the EU in terms of the amount of its GDP, following Germany, the United Kingdom, and France. The output value of Italy's entire industrial sector accounted for 23.5% of the GDP in 2014 (U.S. Central Intelligence Agency, 2015; World Bank, The, 2015).

The mineral industry in Italy had transitioned from being an important producer of raw materials to a manufacturer and processor of metals and steel, construction and industrial products, and industrial minerals and aggregates. Industrial minerals, however, were still important to the mineral industry of the country, particularly the production of construction materials, mineral manufacturing components, and stone. Italy was the 11th-ranked crude steel producer and the 14th-ranked manufacturer of cement in the world, as measured by tonnage of production. Italy had ceased mining for metals, and the raw materials necessary for its metal refining industry were imported or obtained from secondary scrap recovery. Italy produced principally cement, clays, gypsum, lime, limestone, salt, sand and gravel, silica sand, and talc. Natural gas and crude oil and petroleum refinery products continued to be important mineral commodities for the country. In 2014, the production of crude oil in Italy increased by 4% and that of natural gas decreased by 8% in terms of volume compared with production in 2013. The amount of natural gas produced from offshore fields, mostly from the Adriatic Sea, was almost double that produced inland. The production of crude oil took place mostly inland, specifically in the Regions of Basilicata and Sicilia, rather than offshore. Despite the availability of domestically produced gas and crude oil, Italy was not energy self-sufficient, and the country relied on energy imports to satisfy its domestic energy consumption (tables 1, 2; Cembureau, 2014b, p. 7; 2015, p. 13; Ministero dello Sviluppo Economico, 2015, p. 29–30; World Steel Association, 2015, p. 9).

Minerals in the National Economy

In terms of value, the services sector in Italy accounted for the largest share of the GDP in 2014, or $1.4 trillion.[1] The total value of manufacturing, mining, quarrying, and other industrial production amounted to $342.6 billion, of which manufacturing amounted to $292.7 billion. Construction sector output was valued at $86.5 billion. Gross salaries in the industrial and mining and quarrying (including hydrocarbon extraction) sectors amounted to $142.2 billion, and gross salaries in the manufacturing sector amounted to $128.7 billion (Italian National Institute of Statistics, 2015b, 424–426).

As reported by the Italian National Institute of Statistics in 2014, the output of the mining and mineral-manufacturing sector decreased by 2.9% compared with that of 2013; that of the oil-refining and coke-producing sector decreased by 5.6%, and that of the metallurgical and metal-manufacturing sector increased by 0.1%. Since 2010, the output of the mining and mineral-manufacturing sector had decreased by 8.3%, that of the oil-refining and coke-producing sector had decreased by 24.3%, and that of the metallurgical and metal-manufacturing sector had decreased by 4.8% (Italian National Institute of Statistics, 2015b, p. 571, 576).

According to the Italian National Institute of Statistics, there were 2,336 companies in the mining and quarrying sector, of which 1,850 had 9 employees or less. The Institute reported that a total of 32,813 people worked in the sector, however, and that of that amount, the vast majority (27,331) worked for companies with 10 or more workers (Italian National Institute of Statistics, 2015a, p. 27).

Government Policies and Programs

The Government played a significant role in the economy through regulation of ownership of large financial and industrial companies; privatizations and regulatory reform in accordance with EU directives, however, had reduced that role in recent years. Italy's basic mining legislation is Mining Law No. 1443 of July 29, 1927, which gives subsoil ownership of minerals to the state. The reimbursement of the state by mining concessionaires is regulated by law No. 752 of June 10, 1982. Quarrying operations are regulated by law No. 44 of September 1982.

All petroleum and gas upstream activities are supervised by the Ufficio Nazionale Minerario per gli Idrocarburi e la Geotermia [National Office for Mining, Hydrocarbons, and Geothermal Resources] (UNMIG), which operates within the Ministero dello Sviluppo Economico [Ministry of Economic Development]. After various organizational changes, the eight divisions that compose the UNMIG now all operate within the Directorate General for Energy and Mineral Resources. By Presidential decree, in 2007, the Committee for Hydrocarbons and Mineral Resources (CIRM) was set up to carry out the UNMIG's duties. The committee performs technical advisory tasks related to hydrocarbons, mineral royalties, and mining, (Ministero dello Sviluppo Economico, 2010).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.7489=US$1.00 for 2014 and EUR0.73=US$1.00 for 2013.

Production

In 2014, the mineral commodities with the largest increases in production, in terms of tonnage, were gypsum (production increased by 186%), slate (121%), primary refined lead (67%), and refined copper (61%). Also, the production of common clay increased by 26% and that of sandstone and zinc metal increased by 24% each. In 2014, the mineral commodities with the largest decreases in production, in terms of tonnage, were salt (production decreased by 48%) and ball clay (44%). Also, production of crushed and broken stone decreased by 31%; silica sand, by 28%; and dolomite, by 4% (table 1).

Structure of the Mineral Industry

The Italian Government had ultimate control of Italy's mineral industry. Mineral resources, by law, are the property of the state, but private and mixed public and private entities were the principal owners of Italy's mineral industry. Significant companies with operations in Italy were Glencore plc of Switzerland (which had a lead refinery at San Gavino); IMI FABI S.p.A. (talc mine at Orani); Italcementi S.p.A. (major plants in Calusco, Collefero, and Monselice); Lucchini S.p.A. (produced pig iron at its plant in Trieste); the Riva Group (several steelmaking plants, of which the most significant was the steelworks in Taranto); and the petroleum and hydrocarbons company Eni S.p.A. (oilfields offshore Sicily and in the Adriatic Sea, and onshore in the Po River Valley) (table 2).

Mineral Trade

In 2014, Italy exported a total of $532.6 billion in goods and services, which was an increase of 2.2% compared with that of the previous year, and imported a total of $476.6 billion, which was a decrease of 1.1% compared with that of the previous year. This was a net increase in exports of $56.0 billion, or an increase of 0.6% compared with exports in 2013.

Italy's exports in 2014 accounted for 2.8% of all world exports, making Italy the eighth-ranked exporter in the world in terms of the value of its exports. Italy's imports accounted for 2.4% of all imports in the world, making it the 12th-ranked importer in the world in terms of the value of its imports. Italy exported $292.2 billion worth of goods and services to the EU, or 54.9% of all its exports. Italy imported $272.3 billion from EU countries, or 57.1% of all its imports. Italy's principal export trade partners within the EU were Germany, which received exports from Italy valued at $67.0 billion, or 12.6% of Italy's total exports; France, $56.1 billion (10.5%); the United Kingdom, $28.0 billion (5.2%); Spain, $24.1 billion (4.5%); and Belgium, $17.6 billion (3.3%). Italy's principal export partners outside the EU were the United States, which received exports from Italy valued at $39.7 billion, or 7.5% of Italy's total exports; Switzerland, $25.4 billion (4.8%); and China, $14.0 billion (2.6%). Italy's principal import trade partners within the EU were Germany, which supplied Italy with imports valued at $72.6 billion, or 15.2% of Italy's total imports; France, $41.1 billion (8.6%); the Netherlands, $27.8 billion (5.8%); Spain, $23.0 billion (4.8%); and Belgium, $20.1 billion (4.2%). Italy's principal import partners outside of the EU were China, which supplied Italy with imports valued at $33.5 billion, or 7.0% of Italy's imports; Russia, $23.1 billion (4.8%); and the United States, $16.7 billion (3.5%) (Ministero dello Sviluppo Economico, 2015).

Italy exported a total of $1.6 billion worth of mining and quarrying products in 2014, which was about the same as in 2013. Italy imported $64.0 billion, which was a 19.6% decrease compared with imports in 2013 (Italian National Institute of Statistics, 2014, p. 26).

Italy accounted for 11.1% of all imports and 9.7% of all exports of mineral fuels, lubricants, and related materials from the EU to countries outside the EU. Italy also accounted for 11.4% of imports and 6.7% of exports of raw materials from the EU. Italy traded mostly with its EU partners, as 70.1% of all Italy's exports went to EU members and 66.3% of its imports came from EU members (European Commission, 2014a–e; U.S. Census Bureau, 2015).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—In August, Alcoa Inc. of the United States announced that it intended to permanently close its Portovesme primary aluminum smelter, which had been curtailed since 2012. The company stated that the closure would reduce Alcoa's global smelting capacity by 150,000 metric tons per year to a total of 3.6 million metric tons per year. Originally, the Portovesme smelter had been curtailed because it was one of the highest cost smelters that Alcoa operated and because the company estimated that it had limited prospects for becoming competitive. Alcoa stated that total restructuring charges for the third quarter of 2014 as a result of the closure were expected to be between $170 million and $180 million (Alcoa Inc., 2014).

Iron and Steel.—In November, Italy's second largest steelmaker, Lucchini, stated that it would ask the Government to allow it to sell its complex in Piombino, Tuscany, to conglomerate Cevital Group of Algeria. Although the company had received two binding offers for its core assets, one from Cevital and one from Indian steelmaker JSW Steel, Lucchini chose Cevital's offer as being the most attractive, stating that the Algerian company had said that it would retain all personnel currently working at the plant. In December, Italy's Ministry of Economic Development authorized the sale of the Lucchini steel complex, stating that this transaction would entail an investment of $534 million and that Cevital would immediately rehire all 1,860 workers that had previously been employed at the plant. The Ministry indicated that Cevital's plan for Piombino included the construction of a fourth rolling mill and the construction of two electric furnaces, of which the first was planned to be completed within 18 months and the second was planned to be completed within 2 years so that the plant could resume full-cycle production. Lucchini had been placed under special administration since late 2012 after being declared insolvent in an effort to avoid job losses. Lucchini had been purchased by Russian steelmaker Severstal in 2005 from the Lucchini family and had failed to remain profitable in the context of falling steel prices and difficult economic conditions (SteelOrbis.com, 2014a, b).

Lead and Zinc.—Glencore remained the country's principal processor (smelter and refinery) of lead and zinc; the company operated a plant at Portovesme, Sardinia. Glencore stated in its 2014 preliminary results that the Portovesme facility had increased production owing to the commissioning of the solvent-extraction plant during 2013. The company also stated that lead production also had increased owing to the restart of Portovesme's lead plant in late 2013 (Glencore plc, 2015, p. 24).

Industrial Minerals

Cement.—Italcementi S.p.A. announced in June that it would purchase the remaining outstanding shares of Société des Ciments Français, and would absorb the company completely and delist it from the Paris stock exchange. This delisting took place on July 15, officially completing the acquisition of Société des Ciments Français by Italcementi. The company stated that it was looking at its options, as the cement market was seeming to consolidate. Italcementi was the fourth-ranked producer of cement in the world after LafargeHolcim of Switzerland, HeidelbergCement of Germany, and CEMEX S.A. of Mexico (Global Cement, 2014).

Italian cement consumption decreased by 8% in 2014 compared with that of 2013. The decrease was generally experienced in the civil engineering works sector as well as in the nonresidential and residential construction sectors. The reduction was a reflection of the prevailing economic conditions of the country in 2014, and Cembureau expected that this trend would probably continue and that cement consumption would continue to decrease in the future (Cembureau, 2015, p. 19).

Outlook

Italy is one of the largest EU members in terms of population and the size of its industrial sector; however, the economic conditions that have affected the country since 2008 continue to affect its mineral and industrial production sectors. Unemployment and a sizable public debt have reduced the capacity of national consumption to support the manufacturing and construction sectors in Italy, and the country will likely continue to rely on exports to strengthen its manufacturing industry. The manufacturing industry will continue to rely on imported and recycled primary mineral materials, particularly copper. The country is also likely to continue to rely on major imports of mineral fuels, despite potential increases in domestic mineral fuels production. Economic reforms and austerity programs will continue and, as such, it is likely that these measures will curtail future increases in domestic consumption.

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TABLE 1
ITALY: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Metal:						
Primary		168,000	141,000	110,000	--	--
Secondary[3]		1,246,236	1,049,101	1,002,814	1,061,603	1,000,000 [e]
Total		1,414,236	1,190,101	1,112,814	1,061,603	1,000,000 [e]
Copper, metal, refined, all kinds[e]		1,800	7,600	7,700	4,900	7,900
Iron and steel, metal:						
Pig iron	thousand metric tons	8,555	9,838	9,424	6,935	6,371
Steel, crude	do.	25,750	28,735	27,257	24,058	23,714
Lead:						
Mine output, Pb content[e]		800	800	--	--	--
Metal, refined:						
Primary		--	--	--	30,000	50,000
Secondary		150,000	149,500	138,400	151,000 [r]	160,000
Total		150,000	149,500	138,400	181,000	210,000
Zinc, metal, primary		104,700	110,200	97,200	111,000	138,000
INDUSTRIAL MINERALS						
Bromine[e]		300	300	--	--	--
Cement, hydraulic	thousand metric tons	34,408	33,120	26,200	22,000	21,400
Clays, crude:						
Common clay	do.	5,900	4,750	3,777	4,212	5,297
Bentonite	do.	111	102	144	103	100 [e]
Refractory, excluding kaolinitic earth	do.	844 [e]	844 [e]	878	870	870 [e]
Ball clay	do.	612	638	746	696	387
Gypsum	do.	4,441	5,939	2,563	2,994	8,551
Lime, hydrated, hydraulic, and quicklime[e]	do.	5,800	5,800	5,800	3,640	3,600
Nitrogen, N content of ammonia[e]	do.	460	460	590 [r]	570 [r]	570
Pigments, mineral, iron oxides, natural		117	112 [e]	118 [e]	137 [e]	130 [e]
Salt	thousand metric tons	4,006	2,912	3,098	2,879	1,501
Sand and gravel	do.	150,996	164,844	123,049	102,381	73,690
Silica sand	do.	17,656	16,369	13,946	13,870	11,602
Stone:						
Calcareous:						
Alabaster[e]	do.	7,000	7,000	7,000	2,912	2,900
Chalk[e]	do.	200	200	200	790	719
Dolomite	do.	1,572	1,139	1,069	751	723
Limestone for lime and cement	do.	38,440	37,269	28,524	24,706	26,297
Marble and travertine, crude	do.	5,500	3,516	3,348	2,819	3,014
Crushed and broken[4]	do.	80,336	76,793	74,169	63,782	44,143
Granite	do.	1,614	1,585	1,734	1,160	1,001
Sandstone	do.	497	440	281	270	336
Slate	do.	55	61	44	43	95
MINERAL FUELS AND RELATED MATERIALS						
Asphalt and bituminous rock, natural	thousand metric tons	1,454	2,169	2,100 [e]	1,158	1,140
Gas, natural	million cubic meters	8,296	8,438	8,608	7,731 [r]	7,136
Petroleum:						
Crude	thousand 42-gallon barrels	35,040	36,201	36,865	37,157	38,690
Refinery products	do.	688,646	653,533	617,543	549,690 [r]	550,000

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through January 7, 2016.

[2] In addition to the commodities listed, Italy produced a number of other metals, alloys, and industrial minerals, such as barite, coke, diatomite, feldspar, ferromanganese, ferrosilicon, fuller's earth, kaolin, magnesia, perlite, pozzolan, pumice, silicomanganese, soda ash, sodium sulfate, sulfur, and talc, but actual output was not regularly reported, and available information was inadequate to make reliable estimates of output.

[3] Unwrought aluminum alloys in secondary form.

[4] Output of limestone and serpentine for dimension stone is included with "Stone: Crushed and broken."

TABLE 2
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Barite	Bariosarda S.p.A. (Ente Mineraria Sarda)	Barega and Mont 'Ega Mines on Sardinia	100
Do.	Edem S.p.A. (Government)	Mines at Val di Castello, Lucca	20
Do.	Edemsarda S.p.A. (Soc. Imprese Industriali)	Mines at Su Benatzu, Sto. Stefano, and Peppixeddu, Sardinia	20
Do.	Societá Mineraria Baritina S.p.A.	Mines at Marigolek, Monte Elto, and Primaluna, near Milan	20
Bauxite	Sardabauxiti S.p.A. (Cogein S.p.A., 40%; Comtec S.p.A., 40%; Icofin Co., 20%)	Mine at Olmedo, Sardinia	350
Bentonite	Industria Chimica Carlo Laviosa S.p.A	Mines and plant on Sardinia and a plant near Pisa	250
Cement	11 companies, of which the largest are:		
Do.	Italcementi S.p.A. (Italcementi Group)	18 plants, of which the largest are Calusco, Monselice, and Collefero	15,000
Do.	Buzzi Unicem Group	11 plants, of which the largest are Guidonia, Lugagnano, Morano, Piacenza, S'Arcangelo di Romagna, and Settimello	9,000
Do.	Cementerie del Tirreno S.p.A.	6 plants at Arquasta Scivia, Livorno, Maddaloni, Napoli, Spoleto, and Taranto	5,300
Coal, lignite	Ente Nazional per l'Energia Electrica	Surface mine at Santa Barbara (closed)	1,000
Copper:			
Refined	Simar S.p.A. (Cordifin S.p.A.)	Refinery at Porto Marghera	60
Refined, secondary	KME Italy S.A. (KME Group S.p.A.)	Refinery at Fornaci di Barga and Scrivia	24
Do.	Sitindustrie S.p.A.	Refinery at Pieve Vergonte	22
Feldspar	At least 5 companies, of which the largest are:	Locations:	1,500
Do.	Maffei S.p.A.	Surface mines at Pinzolo and Campiglia	(200)
Do.	do.	Underground mine at Vipiteno	(300)
Do.	Miniera di Fragne S.p.A.	Surface mine at Alagna Valsesia	(60)
Do.	Sabbie Silicee Fossanova S.P.A.	Surface mine at Fossanova	(30)
Gypsum	Fassa S.r.l.	Plant at Moncalvo, Asti	90
Iron	Altiforni e Ferriere di Servola S.p.A. (Lucchini S.p.A.)	Pig iron and coke plant at Trieste	500
Lead, metal	Glencore plc.	Refinery at San Gavino, Sardinia	100
Do.		Kivcet smelter and Imperial smelter at Porto Vesme, Sardinia	85
Lime	Unicale S.p.A.	Plants in Lombardia Region	500
Magnesium, metal	Societa Italiana Magnesio S.p.A.	Plant at Bolzano	8
Marble	A number of companies, of which the largest include:	Locations:	2,000
Do.	Mineraria Marittima Srl	Quarries in the Carrara and Massa areas	(500)
Do.	Industria dei Marmi Vicentini S.p.A.	do.	(300)
Do.	Figaia S.p.A.	do.	(100)
Nitrogen, N content of ammonia	Hydro Agri S.p.A.	Plant at Ferrara	410
Petroleum:			
Crude	Eni S.p.A.	Oilfields offshore Sicily and in the Adriatic Sea and onshore in Po River Valley	90
Refined thousand 42-gallon barrels per day	Various companies	About 14 refineries	2,000
Potash, ore	Industria Sali Otassici e Affini per Aziono S.p.A.	Underground mines at Corvillo, Pasquasia, and Racalmuto, Sicily.	1,300
Do.	Sta. Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Casteltermini and Pasquasia, Sicily	700

See footnotes at end of table.

TABLE 2—Continued

ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Pumice	Pumex S.p.A.	Quarries on Lipari Island, north of Sicily	600
Do.	Sta. Siciliana per l'Industria ed il Commercio della Pomice di Lipari S.p.A. (Italpomice S.p.A.)	do.	200
Pyrite	Nuova Solmine S.p.A.	Underground mines at Campiano and Niccioleta	900
Salt, rock	Sta Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Petralia, Racalmuto, and Realmonte, Sicily	4,000
Do.	Solvay S.p.A.	Underground mines at Buriano, Pontteginori, and Querceto, Tuscany	2,000
Steel	Ilva S.p.A. (Riva Group)	5 steel plants, the largest of which is Taranto (1,500)	4,000
Do.	Riva Acciaio S.p.A. (Riva Group)	7 steel plants	7,000
Do.	Cevital S.A.	Steel plant in Piombino	2,500
Do.	Acciaierie e Ferriere Vicentine Beltrame S.p.A. (AFV-Beltrame S.p.A.)	Steel plant at Vicenza	1,000
Talc	Luzenac Val Chisone S.p.A.	Mines at Pinerolo, near Turin, and an open pit mine at Orani, Sardinia	120
Do.	IMI FABI S.p.A.	Mine at Orani, Sardinia	20
Zinc, metal	Glencore plc.	Plant at Porto Vesme, Sardinia	140
Do.	Pertulosa Sud S.p.A.	Plant at Crotone, Calabria	100

Do., do. Ditto.

THE MINERAL INDUSTRY OF KAZAKHSTAN

By Elena Safirova

Kazakhstan produced a diverse range of mineral commodities and was the world's leading producer of uranium (41% of world output); the second-ranked producer of chromite (14% of world output); and the fourth-ranked producer of titanium sponge (5% of world output, excluding United States production) and magnesium metal (2% of world output). The country was also a significant producer of barite, bauxite, cadmium, copper, sulfur, and zinc. The mineral industry accounted for a significant share of the country's gross domestic product (GDP) and export revenue; petroleum and natural gas were the leading commodities in terms of production value. Kazakhstan's Government promoted the development of the mineral industry and owned interests in a number of significant mineral-commodity-producing companies (U.S. Energy Information Administration, 2015; World Nuclear Association, 2015; Apodaca, 2016; Bedinger, 2016; Bray, 2016a, b; Brininstool, 2016; Jaskula, 2016; McRae, 2016; Papp, 2016; Tolcin, 2016a, b).

Minerals in the National Economy

In 2014, Kazakhstan's real GDP increased by 4.4% compared with that of 2013, and the nominal GDP in 2014 was valued at $217.9 billion.[1] Total industrial production was valued at $103.4 billion, and real industrial production in 2014 increased only by 0.3% compared with that of 2013. Mineral extraction played a significant role in industrial production; $61.7 billion, or 59.7% of the value of industrial production, was from this sector, which included $50.7 billion from the extraction of crude petroleum, $3.5 billion from the mining of nonferrous metal ores, $1.2 billion from the mining of iron ore, $1.2 billion from the extraction of coal and lignite, and $478 million from the extraction of natural gas. In comparison with 2013, real output of nonferrous and precious metals increased by 10.1% in 2014; natural gas, by 7.6%; and ferrous metal ores, by 6.7%. On the other hand, real output of coal decreased by 1.9%; crude petroleum, by 1.2%; and ferrous ores, by 0.6%. In 2014, metallurgy contributed $10.7 billion to industrial output, of which nonferrous metallurgy and production of precious metals contributed $6.4 billion. Petroleum refining and coke production accounted for $3.2 billion. Compared with 2013, real output of ferrous metals increased by 8.9% in 2014; that of petroleum refining and coke production increased by 2.5%, and real output of precious and nonferrous metals decreased by 3.8% (Agency of Statistics of the Republic of Kazakhstan, 2015a, b).

Government Policies and Programs

In 2014, Kazakhstan's Government was focused on accelerating exploration for mineral resources and increasing the rate of replenishment of mineral resources. At the beginning of the year, the Ministry of Industry and New Technologies (MINT) announced that the Government planned to announce tenders for exploration of 105 prospective lots. According to the program for development of the mineral resource base, the Government would invest 161 billion tenge (about $898 million) between 2015 and 2019. The MINT reported that during 2000–13 Kazakhstan invested 234 billion tenge (about $1.31 billion) in exploration. In addition, special attention would be paid to exploration in close proximity to towns and cities where livelihoods depended on the availability of minable mineral resources. An investment of 25 billion tenge (about $139 million) would be invested in socioeconomic development of the cities of Jezkazgan and Satlaev and the Ulytau District of the Karaganda region. The investment program would focus on exploration for copper, gold, and rare metals. The Government anticipated that, as a result of increased investment in exploration, Kazakhstan could discover as many as 15 new world-class mineral deposits in the next several years (Mineral.ru, 2014n; MinerJob.ru, 2014e, l).

In addition to the Government's own spending on exploration, Government agencies encouraged private businesses to increase their exploration efforts. In February, TOO Kazzinc and the MINT signed a memorandum for mutual cooperation in the area of exploration. Kazzinc promised to invest at least 15 billion tenge (about $84 million) in exploration in Kazakhstan between 2014 and 2018. Rio Tinto Group of Australia also started exploration work in Kazakhstan. The company's initial exploration budget was expected to amount to 2.73 billion tenge (about $15 million). Rio Tinto's initial exploration efforts would be field work in the Karaganda region (MinerJob.ru, 2014k, m; 2015a).

In February, the Government prepared legislation that would allow the use of auctions as mechanisms for distribution of subsoil lots for exploration and mining. The introduction of such mechanisms would simplify the procedure for both the Government and the prospective subsoil users. It was expected that the competitive principle of resource distribution would increase transparency and would preclude corruption associated with the issuance of mining licenses. The new legislation included a total of 189 amendments to three separate laws of Kazakhstan. In addition to auctions, the new legislation would allow mining companies to change production volumes by up to 20% of the original volume without obtaining approval from the relevant Government entity. It would also expand access to available geologic information for the mining companies, and would exclude a prefeasibility study from the documents required for submission with a mining application. For the cases of less competitive resources, the Government would offer mining licenses on a first-come-first-served basis, with regular annual increases in user fees. The new legislation would be considered first by the lower chamber of Kazakhstan's Parliament (MinerJob.ru, 2014l).

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[1] Where necessary, values have been converted from Kazakhstani tenge (KZT) to U.S. dollars (US$) at an annual average exchange rate of KZT179.19=US$1.00 for 2014.

In February, the Government announced that it would set quotas for foreign specialists to be employed in several projects of high priority. Foreign specialists would be employed in a total of 12 projects—construction of the Aktogay GOK (800 persons), construction of the Bozshakol GOK (1,920 persons), expansion of the Ekibastuz hydropowerplant (1,286 persons), construction of the Balkhashskaya thermal powerplant (800 persons), and several others, with the total demand for 5,142 foreign workers. In addition to the quota system, the Government planned to invite foreign specialists to Kazakhstan based on a point system. The point system would permit professionals to obtain temporary work permits based on their qualifications and then look for work in Kazakhstan. Government officials stated that the second system would be used mostly for college professors, engineers, managers, and researchers. The draft legislation was supposed to be considered by the Parliament in the fall of 2014, but no information was available about the outcome (MinerJob.ru, 2014a, f, g).

Beginning on April 1, 2014, the Government increased the export tariff on crude oil to $80 per metric ton from $60 per metric ton (to $11 per barrel from $8.20 per barrel). The announced reason for the increase was to increase Government revenues. The Eurasian Economic Commission (EEC) (the supranational body of the Eurasian Economic Union) reduced import tariffs for lead ores and concentrates to zero from 4% for the period from April 1, 2014, to March 31, 2015, in Belarus, Kazakhstan, and Russia. The measure covered ores and concentrates with a lead content of at least 45%. Kazakhstan, in particular, experienced shortages of lead produced domestically and imported from Russia and Tajikistan and had to import additional amounts from Peru. In April, the EEC announced its decision to set import tariffs for rare-earth metals, scandium, and yttrium, both as pure metals and in alloys, to zero from May 1, 2014, to April 30, 2015. The EEC explained that these metals were used to produce superhard materials and, therefore, the measure would promote development of advanced technologies in the countries of the Eurasian Economic Union (Mineral.ru, 2014b, h; MinerJob.ru, 2014h).

Production

Output of mineral commodities in 2014 generally remained close to the levels of output in 2013. Production of niobium increased by an estimated 64%; ammonia, by 39%; refined lead, by 38%; and cadmium, by 24%. Production of pig iron increased by 21%; phosphate rock, by 18%; barite, by 16%; gold, both refined and metal, by 15% each; cement and coke, by 13% each; and salt and sulfuric acid, by 12% each. At the same time, ferrosilicon production decreased by 29%; tantalum, by 28%, and copper smelter production, by 20%. These and other production data are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2014, the value of Kazakhstan's exports accounted for $79.5 billion, which was a 6.2% decrease compared with the value of exports in 2013. In 2014, Kazakhstan's imports decreased by 16.4% to $41.3 billion. In the commodity structure of Kazakhstan's exports, mineral products accounted for 80.4%. The reduction in export revenues in 2014 compared with those in 2013 was because of the reduction in exports of the following commodities: crude oil, the revenues from which decreased by 6%, to $53.6 billion from $57.2 billion; uranium products, by 18%, to $1.9 billion from $2.3 billion; refined copper, by 36%, to $1.7 billion from $2.7 billion; ferroalloys, by 10%, to $1.56 billion from $1.72 billion; and ferrous ores and concentrates, by 29%, to $1.1 billion from $1.6 billion. On the other hand, exports of copper ores and concentrates increased by 43%, to $840 million from $588 million (because the Jezkazgan smelter did not operate during most of 2014), and zinc exports decreased by 21%, to $588 million from $487 million. Among final products, revenues from exports of refinery products were $2.97 billion, which was a 6% decrease compared with the revenues in 2013 (Agency of Statistics of the Republic of Kazakhstan, 2015c; Kaznex Invest, 2015).

Kazakhstan's main export partner was Italy, which received 20.2%, by value, of the country's exports. It was followed by China (12.3%), the Netherlands (11.0%), Russia (8.0%), France (5.9%), Switzerland (5.7%), Romania (4.0%), Austria (3.6%), and Spain (3.0%). The major commodities imported were foodstuffs, machinery and equipment, and metal products. Kazakhstan's main import partner was Russia, which provided 33.4% of Kazakhstan's imports, by value. It was followed by China (17.8%); Germany (5.6%); the United States (4.8%); Ukraine (2.9%); France and the Republic of Korea (2.6% each); Italy, Turkey, and Uzbekistan (2.5% each); and Japan (2.2%) (Agency of Statistics of the Republic of Kazakhstan, 2015a, c).

Commodity Review

Metals

Copper.—In March, the MINT announced that Kazakhstan's forecast resources of copper were estimated to be about 100 million metric tons (Mt). From 2003 to 2012, between 25 and 53 deposits were being mined, and the total production was 5.2 Mt of copper. Annual production fluctuated between 472,000 and 567,000 metric tons per year (t/yr). During that period, the resources increased by 3.9 Mt, which was 76% of the resources depleted during the period. In 2012 (the latest year for which data were available), resources increased by 348,000 metric tons (t) of copper (Mineral.ru, 2014o).

Kazakhmys plc was the dominant producer of copper ore and copper metal in the country. In 2014, the company produced 83,500 t of copper cathodes, which was a 9% increase compared with 76,800 t that the same assets produced in 2013. The company stated that modernization increased the copper recovery rate at the Nikolayevskaya plant in eastern Kazakhstan to 88% from 82%. In 2014, Kazakhmys produced 4.6 Mt of copper ore, including 426,000 t produced at the Bozymchak Mine in Kyrgyzstan. In 2014, the average copper content of all copper ores mined by the company was 2.35%. The revenue of the company was affected by the reduction of copper prices on the world market and by the reduced demand for copper. The company reported that of 83,500 t of copper cathodes produced in 2014, the company sold only 78,200 t during 2014 (Mineral.ru, 2014c, e).

In October 2014, Kazakhmys completed a restructuring. The mines and plants located in Balkhash, Jezkazgan, and Karaganda (approximately two-thirds of copper assets) were divested to Cuprum Holdings Groups, which was registered in Mauritius. Kazakhmys agreed pay $240 million as working capital for the assets that were divested to Cuprum Holdings. The public company Kazakhmys plc retained the remaining assets and was renamed KAZ Minerals plc. KAZ Minerals retained mining and processing assets in eastern Kazakhstan and the Bozymchak Mine in Kyrgyzstan. It also continued working on major development projects Aktogay, Bozshakol, and Koksay. The company intended to concentrate on low-cost projects with long mine lives. Because of the reorganization, KAZ Minerals reduced its overall copper production in 2014 to 83,500 t from 294,000 t in 2013. The company sought to return to producing about 300,000 t in 2018 after the Aktogay and the Bozshakol sites were developed (Kayakiran, 2014).

Kazakhmys began construction of the Bozshakol mining and metallurgical complex (GOK) in the Pavlodar region in 2011. The total cost of the project was 406 billion tenge (about $2.7 billion) and, as of November 2014, about 53% of the total investment was already expended. The Bozshakol GOK would have the capacity to process 100,000 t/yr of copper concentrate. The pilot production was to start at the end of 2014, and, in 2015, the plant would begin regular production of copper concentrate. Bozshakol is a polymetallic deposit containing copper, gold, molybdenum, and other metals (MinerJob.ru, 2014b, 2015b).

In 2014, Kazakhmys (the portion of the company presently known as KAZ Minerals) continued construction of the mine and processing facilities at its Aktogay deposit in eastern Kazakhstan. The company was building an open pit mine with a total construction cost of 245 billion tenge (about $1.5 billion), about one-half of which was already expended. The first complex for processing of oxidized ores was to be completed in 2016. The complex would employ 1,500 workers and would have the capacity to produce 85,000 t/yr of copper concentrate and 25,000 t/yr of copper cathodes. The mine was expected to begin operations in March 2016, and to reach full capacity in 2018. According to earlier company plans, the mine was expected to be completed by 2012, but construction was delayed by contractors' holdups. In 2014, Non Ferrous China (NFC) became the primary construction contractor. In addition to the processing complex, the project involved the construction of powerlines and a railway line as well as excavations and cement works (MinerJob.ru, 2014c).

In February, Kazakhmys reported that it had obtained the rights to develop the Koksay deposit, which is located in the Alma-Aty region. The seller was a private nonaffiliated company, CCC Mining Construction B.V. of the Netherlands, and the total amount of the transaction was $260 million. The transaction was subject to approval by the Government and its regulatory agencies. The first payment of $30 million was due on January 1, 2015, and the second payment of $35 million was due on July 31, 2015, after the resources of the deposit were confirmed. The deposit is situated about 230 kilometers (km) from Alma-Aty in an area with well-developed infrastructure. The deposit's resources were estimated to contain 3.4 Mt of copper; the average grade of the resource was 0.48%. Additionally, the deposit contains gold, molybdenum, and silver. At the beginning of 2014, the Koksay project was undergoing early states of a feasibility study. The preliminary production plans assumed that the future mine would have the capacity to produce 80,000 t/yr in copper-cathode equivalent, 1,900 kilograms per year of gold, 12.4 t/yr of silver, and 1,000 t/yr of molybdenum in concentrates, with an expected mine life of 20 years (Mineral.ru, 2014d; MinerJob.ru, 2014d).

In October, the Jezkazgan smelter, which is located in Karagandy Province, resumed operations after a year-long conservation. The plant stopped operating in September 2013, in order to change the technology at the smelter. Previously, the smelter had employed an electric thermal furnace, which was appropriate for the concentrates obtained from the Jezkazgan Mine, but it was not able to process other types of concentrates, such as concentrates from the Bozshakol Mine. The modernization was to switch the smelter to hydrometallurgical technology that would be able to handle a wider variety of copper concentrates. The management of the smelter reported that after the reconstruction, the plant would have the same annual capacity as before—about 100,000 t/yr of copper cathodes. It appeared that the planned modernization would start in the near future and would continue through 2017. The opening of the new hydrometallurgical copper smelter was planned for the beginning of 2018 (Mineral.ru, 2014f; MinerJob.ru, 2014j).

In July, Orsu Metals Corp. (Orsu) of the United Kingdom and its partner TOO Asem Tas-N (a private Kazakhstani company) were granted an extension of exclusive rights for exploration of the East Balkhash-2 license area. The extension of 175 days was provided owing to the inclement weather conditions that delayed the drilling and geophysical work needed to evaluate the deposit's resources. Orsu intended to invest up to $500,000 for exploration of the license area. If the results of the exploration warranted production, the two companies planned to create a joint venture, in which Orsu would hold a 55% share. East Balkhash is a polymetallic deposit located west of the Aktogay deposit. According to the exploration data from the Soviet period, one of the Balkhash segments contained resources grading between 1.3% and 5.8% copper and 100 grams per metric ton (g/t) silver. According to the exploration data from 2011, the deposit overall graded 0.98% copper, 20.2 g/t silver, and 0.2 g/t gold (Infogeo.ru, 2012; Mineral.ru, 2014k).

In October, the Governments of Kazakhstan and Russia signed an intergovernmental agreement to develop the Vesenne-Aralchinskoye deposit, which is located on the border between the two countries. ZAO Russian Copper Co. of Russia (RMK), which was one of the top three copper producers in Russia, had mining licenses for the deposit, both in Kazakhstan and in Russia, through its subsidiaries

ZAO Ormet in Russia and TOO Aktyubinskaya Copper Co. in Kazakhstan. The two subsidiaries planned to process ores mined in their respective countries. In 2013, RMK completed the blueprints of the underground mine in the Aralchinskiy sector of the deposit in Kazakhstan and started construction. The mine would have the capacity to produce 500,000 t/yr of ore and was expected to open in 2016. The resources of the entire Vesenne-Aralchinskoye deposit were estimated to contain 196,800 t of copper, 190,800 t of zinc, 1,270 kilograms of gold, and 100 t of silver (Mineral.ru, 2014m; MinerJob.ru, 2014i).

Molybdenum and Tungsten.—In November, TOO Joint Venture Kazakhstan and Russia Mining Co. announced a plan to build a processing complex for molybdenum-tungsten ores in Kostanay Oblast'. The total cost of the project would be 24 billion tenge (about $134 million). The complex would have the capacity to process 5 Mt/yr of ore and to produce about 14,000 t/yr of molybdenum concentrate and about 3,400 t/yr of tungsten concentrate. According to the regional administration, the feasibility study had been completed and the required construction permits and mining licenses had been obtained. Production was expected to begin at the end of 2015 or the beginning of 2016, and the complex was expected to employ about 900 people (MinerJob.ru, 2014n).

Nickel and Cobalt.—In October, TOO Kaznickel announced that it was planning to open a mine at the Gornostayevskoye silicate nickel-cobalt deposit, which is located in eastern Kazakhstan. TOO Kaznickel was a subsidiary of AO Sat & Co., which acquired Kaznickel in 2009. Sat & Co. also owned the Eptic ferronickel plant and planned to create a full-cycle nickel mining and processing complex. Kaznickel had exploration and mining licenses for the Gornostayevskoye deposit. Kaznickel had been conducting prospecting and exploration work at the deposit since 2004, and, as of late 2014, the company had completed exploration and was ready to begin mining. According to Government records (1999), the deposit's inferred resources were 20.4 Mt containing 173,000 t of nickel and 12,000 t of cobalt. According to another preliminary resource estimate conducted in 2008, the deposit had indicated resources of 13.1 Mt containing 118,000 t of nickel and inferred resources of 13.2 Mt containing 117,000 t of nickel. The total cost of the mining project was estimated to be 33 billion tenge (about $184 million), and the new mining complex would create about 600 jobs (Newskaz.ru, 2009; Inform.kz, 2014).

AO Kazzinc, which was a subsidiary of Glencore Xstrata plc of Switzerland, planned to build a plant for heap leaching of nickel ores with the capacity to process 500,000 t/yr of ore at the Kimpersay group of deposits in Aktobe Province. OAO Irgiredmet of Russia was testing the technology; the pilot project demonstrated that the nickel content in the concentrate was 73%. The projected production capacity of the plant was 3,890 t/yr of nickel and 116 t/yr of cobalt. The preliminary estimate of the cost of the project was 15 billion tenge (about $84 million). According to the Government, the Kimpersay Group of deposits had 39 manifestations of silicate nickel ores and contained two deposits—the Bugor deposit and the Severo-Vostochnaya deposit. The deposits contained 12.8 Mt of mineralized material grading 1.16% nickel, 0.066% cobalt, 0.003% copper, and 2.08% chromium oxide. Earlier, several companies tried to build a plant at Kimpersay, most recently in 2010, but the economic crisis of 2008 and the negative nickel price trend prevented those projects from being completed (Mineral.ru, 2014j).

Industrial Minerals

Potash.—As of 2014, Kazakhstan did not produce potash; however, several projects were underway to start potash production. Junior mining company Kazakhstan Potash Corp. Ltd. (KPC), which was registered in Melbourne, Australia, had mining licenses for two potash deposits in Kazakhstan and was in the process of obtaining a license for one more. The first one was the Zhilyanskoye deposit, which is located in Aktobe Province, 10 km southwest of the city of Aktobe; it contained resources of polyhalite and sylvinite. In December 2014, KPC was negotiating the details of mine construction at the deposit with CITIC Construction Co. of China. According to the project feasibility study, mining at the Zhilyanskoye deposit would be conducted using an underground method. The company planned to produce both potassium chloride and potassium-magnesium sulfate. Initially, the plant would produce 600,000 t/yr of potassium chloride and would increase production to 1.2 Mt/yr within 3 years. The potassium-magnesium sulfate capacity of the plant would begin at 1.2 Mt/yr and increase to 2.4 Mt/yr within 3 years. The project was estimated to cost about $1 billion, and construction was expected to start in 2015 (Kopylov and others, 2014; Mineral.ru, 2014l).

In July, KPC announced that it had signed an agreement to purchase TOO Satimola for $140 million. TOO Satimola, through its wholly owned subsidiary TOO Satbor, had a mining license for the Satimola potash and borate deposit, which is located in western Kazakhstan. It was not clear which entity was the seller of TOO Satimola at the time. In 2006, Satimola was owned by Agapito Associates Inc. of the United States, which planned to start exploration of the deposit by 2008. According to the Joint Ore Reserves Committee (JORC) estimates, indicated and inferred resources of the Satimola deposit were 2.5 billion metric tons (Gt) of potassium chloride with an average K_2O content of 20.1% and a minimal content of 15%. KPC expected to begin production of 2 Mt/yr of potassium chloride and then gradually to increase the production capacity to 6 Mt/yr. The license for the third project, the Chelkarskoye deposit, which is located in western Kazakhstan, was acquired by KPC in 2011 (Kursiv.kz, 2014).

The Government of Kazakhstan was supporting the development of potash production in the country. According to the Government, plans were to produce 7 Mt/yr of potash by 2025. In December, the Government announced that Chinese businesses would invest $3.8 billion in Kazakhstan's potash industry. The construction of mines and plants would start in 2015 and 2016 and would create 5,000 new jobs. The Government and the KPC signed a financing agreement with Industrial and Commercial Bank of China Ltd. (ICBC) and CITIC Capital Holdings Ltd. (CITIC Capital), an investment company of the CITIC Group Corp. of China (Thomson Reuters, 2014).

Mineral Fuels and Related Materials

Uranium.—In 2014, Kazakhstan increased uranium production to 22,829 t from 22,500 t in 2013, which was a 1.5% increase. The country remained the world's leading producer of uranium, accounting for about 41% of world uranium mine output. In 2015, Kazakhstan was planning to increase uranium production to 23,400 t. As of 2014, Kazakhstan had no nuclear powerplants, and all mined uranium was exported. In 2014, Kazakhstan exported $1.9 billion worth of uranium. The primary export partners were China (62% or $1.2 billion), Russia (11% or $219 million), Canada (7%), and France (6%) (Mineral.ru, 2014a; Kaznex Invest, 2015; Newskaz.ru, 2015).

In October, Kazakhstan and Russia agreed to build a nuclear powerplant in East Kazakhstan Province. The agreement, which was signed by the Ministry of Energy of Kazakhstan and the Rosatom State Nuclear Energy Corporation of Russia, allowed for the construction a new power plant with a capacity of up to 1,200 megawatts (MW). The intragovernmental approval procedures were expected to continue through the end of 2014. The tentative location for the future plant was the city of Kurchatov, and construction was expected to begin in 2018 (Mineral.ru, 2014g; TengriNews.kz, 2014).

In June, a new mobile processing installation started operations in the South Kazakhstan Province. The installation was capable of processing the solutions used for underground leaching and was designed for small and remote uranium deposits, which were located far from the stationary processing complexes. The installation was capable of processing 100 cubic meters of solution per hour, which is equivalent to between 20 and 25 t/yr of uranium. The main benefits of the installation were low energy consumption, use of a limited number of chemicals, and a simplified technological scheme; combined, these features were expected to reduce production costs. The installation was developed by the Institute of High Technologies (TOO IVT), which was a subsidiary of the AO NAK Kazatomprom (Mineral.ru, 2014i).

AO NAK Kazatomprom produced 13,156 t of uranium, including production through its shares in joint ventures, which was a 4.4% increase compared with that of 2013. AO NAK Kazatomprom was the national operator for the nuclear industry. It exported uranium and its compounds; rare metals, such as beryllium, niobium, and tantalum; nuclear fuel for nuclear powerplants; and related technologies and equipment. The major activities of Kazatomprom were exploration for and mining of uranium, production of nuclear fuel, production of materials for use in the nuclear industry, and conducting research related to the nuclear industry. Kazatomprom was also developing renewable energy technologies in Kazakhstan. As of 2014, the company employed 25,000 workers (Newskaz.ru, 2015).

Outlook

Interest in Kazakhstan's mineral industry will likely continue to increase along with an increase in the number of projects aimed at exploiting the country's significant mineral resources. Projects involving copper, gold, rare metals, rare-earth elements, and uranium could be of particular interest. The number of exploration projects underway in Kazakhstan indicates the potential for future increases in the production of mineral commodities in the country, but any future development will depend on a variety of factors, including mineral commodity prices and the development of Government policies and programs to encourage the growth of the industry.

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TABLE 1
KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Alumina		1,639,000	1,670,000	1,760,412	1,590,000 [r]	1,419,000
Bauxite, gross weight		5,310,200	5,495,200	5,170,200	5,192,000	4,515,600
Metal, primary		226,000	249,000	250,269	250,159	208,430
Antimony, Sb content of concentrate		785	800	865	-- [r]	481
Beryllium		NA	NA	2,526	1,913 [r]	1,776
Bismuth, metal, refined[e]		150	150	150	150	140
Cadmium, metal		1,400 [e]	1,300 [e]	1,200 [e]	1,319 [r]	1,633
Chromite, marketable ore		3,200,000	3,800,000	3,590,000	3,700,000	3,810,000
Copper:						
Mine output, Cu content of concentrate		380,600	405,300	419,200	440,300	460,300
Metal:						
Smelter, undifferentiated		318,637	302,975	302,576	269,220 [r]	214,058
Refined, primary		323,368	338,524	373,259	352,061 [r]	293,948
Gallium	kilograms	18,702	18,703	15,711	15,500 [e]	15,500 [e]
Gold:						
Mine output, Au content	do.	30,272	36,846	39,903	42,552	49,207
Metal, refined	do.	13,456	16,672	21,133	23,220	26,680
Iron and steel:						
Iron ore, marketable:						
Gross weight		24,016,200 [r]	24,736,100 [r]	25,888,500 [r]	25,228,200	26,024,000
Fe content[e]		13,700,000 [r]	14,100,000	14,800,000 [r]	14,400,000	14,900,000
Metal:						
Pig iron		2,984,000	3,141,100 [r]	2,707,000	2,634,451	3,189,388
Ferroalloys:						
Ferrochromium		1,311,302	1,289,917	1,305,343	1,336,532	1,351,896
Ferrosilicochromium		159,765	143,296	164,853	165,195	158,826
Ferrosilicon		4,813	1,683	494	472	334
Silicomanganese		224,627	232,039	251,530	203,986	200,802
Other		1,283	1,754	1,845	81	3,470
Total		1,701,790	1,668,689	1,724,065	1,706,266	1,715,328
Steel:						
Crude		3,338,000	3,699,300	3,775,836	3,477,000	3,693,000
Finished, rolled		2,899,800	3,107,900	2,402,300	2,277,000 [r]	2,532,200
Lead:						
Concentrate, Pb content		35,400	38,800	38,100	40,100	37,800
Refined, primary and secondary		103,110	111,249	88,099	91,072	125,289
Magnesium, metal, primary[e]		21,000	21,000	21,000	20,000	17,000
Manganese:						
Ore:						
Gross weight		3,044,700	2,963,000	2,975,000	2,850,500	2,608,800
Mn content[e]		610,000	590,000	595,000	570,000 [r]	522,000
Concentrate:						
Gross weight		1,094,400	1,096,300	1,070,500	1,121,000	1,092,300
Mn content[e]		390,000	390,000	390,000	404,000	390,000
Nickel, Ni content of laterite ore[e]		500	500	450	--	--
Niobium, metal		NA	NA	43	44 [e]	72
Silicon, metal[e]		1,500	8,000	10,000	10,000	10,000

See footnotes at end of table.

TABLE 1—Continued
KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS—Continued						
Silver:						
Mine output, Ag content	kilograms	552,060	650,649	963,182	963,829	981,882
Refined	do.	548,990	646,685	958,495	958,258	976,434
Tantalum, metal		NA	NA	213	215 [e]	155
Titanium:						
Ilmenite and leucoxene[e]		25,000	25,000	25,000	20,000	20,000
Sponge		14,500	20,700	21,000 [e]	12,000 [e]	13,000 [e]
Zinc:						
Concentrate, Zn content		405,300	376,700	369,700	361,500	346,600
Smelter, primary and secondary		318,858	319,847	319,900	320,150	324,754
INDUSTRIAL MINERALS						
Asbestos, all grades		214,100	223,100	241,200	243,400	213,100
Barite:						
Ore and concentrate		358,000	466,200	590,100	563,700	655,500
Marketable[e]		200,000	200,000	230,000	250,000 [r]	290,000
Boron[e]	thousand metric tons	300 [r]	300 [r]	300 [r]	348 [r]	507
Cement		6,686,300	7,642,100	7,050,000 [r]	7,071,500 [r]	7,976,800
Fluorspar		65,000 [e]	65,000 [e]	100,000 [e, r]	108,000	110,000 [e]
Gypsum		700,000 [e]	700,000 [e]	1,029,400 [r]	997,000	1,026,700
Lime		886,572	959,827 [r]	908,188 [r]	869,167	923,300
Nitrogen, N content of ammonia		75,347	105,067	83,255	95,135	132,113
Phosphate rock, beneficiated:						
Gross weight		2,000,000 [r]	1,900,000 [r]	2,100,000 [r]	1,700,000 [r]	1,840,000
P_2O_5 content[e]		413,200 [r]	399,900 [r]	438,800 [r]	410,500 [r]	485,400
Rare-earth elements, rare-earth oxide content		--	--	-- [r]	-- [r]	240
Salt		276,131	364,222	463,960	531,429	596,508
Sulfuric acid		1,410,700	1,519,900	1,719,200	2,081,200	2,329,900
Sulfur, byproduct:						
Metallurgy[e]		300,000	300,000	300,000	300,000	320,000
Natural gas and petroleum		2,400,000 [e]	2,400,000 [e]	2,150,500 [r, 3]	2,443,300 [r]	2,455,400
Total		2,700,000 [e]	2,700,000 [e]	2,450,500 [r]	2,743,300 [r]	2,775,400
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	99,285	103,015	112,780 [r]	107,694 [r]	102,378
Lignite	do.	7,283	8,368	7,748	6,690	6,894
Total	do.	106,568	111,383	120,528 [r]	114,384	109,272
Coke		2,526,800	2,663,300	2,569,300	2,379,100	2,697,800
Natural gas:						
Nonassociated gas	thousand cubic meters	17,595,000	19,305,000	20,308,800	20,564,900 [r]	21,278,500
Associated gas	do.	19,811,000	20,199,000	19,820,100	21,679,100 [r]	21,898,300
Total	do.	37,406,000	39,504,000	40,128,900	42,244,000	43,176,800
Petroleum:						
Crude oil and gas condensate[4]	42-gallon barrels	578,000,000	582,000,000	576,200,000	594,589,000	585,986,000
Refinery products[5]	do.	101,600,000	106,200,000	108,400,000	109,783,000 [r]	113,700,000
Uranium:						
U content		17,803	19,451	20,900	22,500	22,829
U_3O_8 content		20,995	22,939	24,648	26,300	26,915

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through December 27, 2015.

[2] In addition to the commodities listed, Kazakhstan may also have produced a number of other mineral products, including mined bismuth, cesium, cobalt, germanium, indium, molybdenum, rhenium, scandium, selenium, tellurium, and vanadium, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Figures were converted to barrels from metric tons, which were reported as follows: 2010—79,684,800; 2011—80,060,900; 2012—79,224,500; 2013—81,786,700; and 2014—80,825,600.

[5] Figures were converted to barrels from thousand metric tons, which were reported as follows: 2010—12,794; 2011—13,393; 2012—13,668; 2013—13,844 (revised); and 2014—14,338.

TABLE 2
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina	Aluminium of Kazakhstan JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Pavlodar	1,600,000
Aluminum, primary	Kazakhstan Aluminium Smelter JSC [Eurasian Natural Resources Corp. plc (ENRC)]	do.	250,000
Barite	Vostochnoye Rudoupravleniye LLP	Shyganak, Zhambyl Province	NA
Do.	Zhartas LLC	Zhambyl Province	25,000
Do.	Stroyservice LLC	Kentau District, South Kazakhstan Province	30,000
Do.	Zhairemsky GOK[3] JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Ushkatyn III, Zhairem, and Zhumanai deposits near Zhairem	NA
Do.	JSC Yuzhpolimetall	Kentau District, South Kazakhstan Province	NA
Do.	Barite Oil Kentau LLC	Kentau District, South Kazakhstan Province	NA
Bauxite	Kazakhstan Aluminium Smelter JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Torgai and Krasnooktyabrsk mining complexes, Kostanay Province	5,400,000
Beryllium, metal	Ulba Metallurgical Plant JSC (Kazatomprom JSC)	Oskemen (also known as Ust-Kamenogorsk)	NA
Bismuth, metal	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International plc, 69.61%)]	do.	NA
Do.	Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	NA
Cadmium	do.	do.	NA
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International plc, 69.61%)]	Oskemen (also known as Ust-Kamenogorsk)	NA
Chromite, marketable ore, 50% Cr_2O_3 content	TNK Kazchrome [a subsidiary of Eurasian Natural Resources Corp. plc (ENRC)]	Khromtau, Aktobe Province	3,600,000
Do.	Oriel Resources Ltd. (OAO Mechel)	Voskhod GOK,[3] Khromtau, Aktobe Province	600,000
Copper:			
Mining, recoverable, Cu content	Kazakhmys plc:[4] Central Region: Konyrat Mine	Karagandy Province	11,800
Do.	Sayak I and III Mines	do.	23,500
Do.	Shatyrkul Mine	Zhambyl Province	12,700
Do.	Abyz Mine	Karagandy Province	5,710
Do.	Nurkazgan Mine	do.	20,000
Do.	Akbastau Mine	East Kazakhstan Province	9,000
Do.	East Region: Artemyevsky Mine	do.	25,000
Do.	Belousovsky Mine	do.	2,700
Do.	Irtyshsky Mine	do.	5,750
Do.	Nikolayevsky Mine	do.	25,700
Do.	Orlovsky Mine	do.	86,200
Do.	Yubileyno-Snegirikhinsky Mine	do.	14,200
Do.	Jezkazghan Region: Annensky Mine	Karagandy Province	25,000
Do.	East Mine	do.	35,000
Do.	North Mine	do.	28,000
Do.	South Mine	do.	30,000
Do.	Stepnoy Mine	do.	30,000
Do.	West Mine	do.	23,300
Do.	Zhomart Mine	do.	60,000

See footnotes at end of table.

TABLE 2—Continued
KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity^e
Copper—Continued:			
Mining, recoverable, Cu content—Continued	Kazzinc JSC (Glencore International plc, 69.61%): Ridder complex: Ridder-Sokolny Mine	East Kazakhstan Province	NA
Do.	Shubinsky Mine	do.	2,750
Do.	Tishinsky Mine	do.	15,000
Do.	Zyrianovsk complex: Maleevsky Mine	15 kilometers north of Zyryanovsk	40,000
Do.	Grekhovsky Mine	NA	NA
Do.	Aktyubinsk Copper Co. TOO (CJSC Russian Copper Co.)	50th Anniversary of October Mine, at Koktau, Aktobe Province	NA
Do.	JSC Polymetal	Varvarinskoye deposit, Kostanay Province	NA
Concentrate, Cu content	Kazakhmys plc: Central Region: Balkhash concentrator	Karagandy Province	40,000
Do.	Karagaily concentrators:		28,000
	Abyz	do.	
	Akbastau	do.	
	Kosmurun	do.	
Do.	Nurkazgan concentrator	do.	15,000
Do.	East Region: Orlovsky concentrator	do.	70,000
Do.	Belousovsky concentrator	East Kazakhstan Province	13,000
Do.	Irtyshsky concentrator	do.	6,000
Do.	Nikolayevsky concentrator	do.	30,000
Do.	Jezkazghan Region: Satpayev concentrator	do.	30,000
Do.	Jezkazghan No. 1 concentrator	do.	88,800
Do.	Jezkazghan No. 2 concentrator	do.	95,000
Do.	Kazzinc JSC (Glencore International plc, 69.61%): Ridder complex: Ridder concentrator	Karagandy Province	10,000
Do.	Zyrianovsk complex: Zyrianovsk concentrator	do.	10,000
Do.	Aktyubinsk Copper Co. TOO (CJSC Russian Copper Co.)	50th Anniversary of October Mine, at Koktau, Aktobe Province	55,000
Do.	JSC Polymetal	Varvarinskoye deposit, Kostanay Province	NA
Metal	Kazakhmys plc mines or plants: Central Region: Balkhash smelter	Karagandy Province	250,000
Do.	Balkhash refinery	do.	250,000
Do.	Jezkazghan Region: Jezkazghan smelter	do.	250,000
Do.	Jezkazghan refinery	do.	250,000
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International plc, 69.61%)]	Oskemen (also known as Ust-Kamenogorsk)	70,000
Do.	Central Asia Metals plc	Karagandy Province	10,000
Ferroalloys:			
Ferrochrome:			
High-, medium-, and low-carbon FeCr containing 69% Cr	Aktobe plant {Kazchrome [Eurasian Natural Resources Corp. plc (ENRC)]}	Aktobe	450,000
High-carbon FeCr containing 69% Cr	Aksu plant {Kazchrome [Eurasian Natural Resources Corp. plc (ENRC)]}	Aksu	850,000
Ferrosilicon	do.	do.	NA
Ferrosilicochromium	do.	do.	NA
Silicomanganese	do.	do.	NA
Do.	Taraz Metallurgical Plant LLP (SAT & Co.)	Taraz, Zhambyl Province	NA
Do.	Temirtau Electrometallurgical Complex	Temirtau, Karagandy Province	NA

See footnotes at end of table.

TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Gallium	Aluminium of Kazakhstan JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Pavlodar	NA
Gold, mined	Kazzinc JSC (Glencore International plc, 69.61%)	Northern Kazakhstan	NA
Do.	Kazakhmys JSC	do.	NA
Do.	Polyus Gold International, Ltd.	do.	NA
Do.	JSC Polimetal	do.	NA
Do.	Nord Gold N.V.	Suzdal Mine	NA
Do.	GMK Kazakhaltyn	Northern Kazakhstan	NA
Do.	AK Altynalmas	Eastern Kazakhstan	NA
Do.	TOO Yubileynoye	Aktobe Province	NA
Indium	Kazzinc JSC (Glencore International plc, 69.61%)	NA	NA
Iron and steel:			
Pig iron	ArcelorMittal Temirtau	Temirtau, Karagandy Province	5,700,000
Steel, crude	do.	do.	6,000,000
Iron ore, marketable, gross weight	JSC Sokolov-Sarbai Mining Production Association [Eurasian Natural Resources Corp. plc (ENRC)]	4 open pit mines and 1 underground mine in Kostanay Province	20,000,000
Do.	TOO Orken (ArcelorMittal Temirtau)	Karagandy Province	5,000,000
Lead:			
Mining, recoverable Pb content of ore	Kazzinc JSC (Glencore International plc, 69.61%): Ridder complex: Shubinsky Mine	15 kilometers east of Ridder	630
Do.	Tishinsky Mine	15 kilometers southwest of Ridder	15,000
Do.	Zyrianovsk complex: Maleevsky Mine	15 kilometers north of Zyryanovsk	26,000
Do.	TOO ShalkiyaZinc Ltd.	Shalkiya Mine, 15 kilometers northeast of Zhanakorgan	NA
Concentrate, Pb content	Kazzinc JSC (Glencore International plc, 69.61%): Ridder concentrator	Ridder, East Kazakhstan Province	NA
Do.	Zyrianovsk concentrator	Zyryanovsk, East Kazkahstan Province	NA
Do.	TOO ShalkiyaZinc Ltd.	Kentau concentrating plant, South Kazakhstan Province	NA
Do.	TOO Nova Zinc (JSC Chelyabinsk Zinc Plant)	Akzhal	4,000
Metal	Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	NA
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International plc, 69.61%)]	Oskemen (also known as Ust-Kamenogorsk)	130,000
Magnesium, metal	Ust-Kamenogorsk titanium-magnesium plant	do.	NA
Manganese, crude ore	Facilities: Kazmarganets {Kazchrome JSC [Eurasian Natural Resources Corp. plc (ENRC)]} Zhairemsky GOK[3] JSC [Eurasian Natural Resources Corp. plc (ENRC)] Atasurda mining and processing complex (TOO Orken) TOO Arman 100 Temirtau electrometallurgical complex	Locations: Tur and East Kamys Mines, Karagandy Province Perstenevsky, Ushkatyn III, Zhomart and Zapadny Zhomart Mines near Zhairem Atasu 170 kilometers east of Zhezkazgahan, Karagandy Province Temirtau, Karagandy Province	NA[5]
Minor metals (indium, selenium, tellurium, thallium, and so forth)	Belogorskiy rare-metals plant	Asubulak, East Kazakhstan Province	NA[6]
Do.	Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	NA[6]
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International plc, 69.61%)]	Oskemen (also known as Ust-Kamenogorsk)	NA
Natural gas	Companies: Tengizchevroil (Chevron Corp., 50%; KazMunaiGas JSC, 20%; ExxonMobil Kazakhstan Inc., 25%; LukArco B.V., 5%) Karachaganak Petroleum Operating B.V. (BG Group plc., 29.25%; ENI S.p.A., 29.25%; Chevron Corp., 18%; OAO Lukoil, 13.5%; KazMunaiGas JSC, 10%) Additional production at smaller fields	Locations: Tengiz and Korolev fields Karachaganak field NA	NA[5]

See footnotes at end of table.

TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Niobium, metal		Ulba Metallurgical Plant (Kazatomprom JSC)	Oskemen (also known as Ust-Kamenogorsk)	NA
Petroleum:				
Crude		Tengizchevroil (Chevron Corp., 50%; KazMunaiGas JSC, 20%; ExxonMobil Kazakhstan Inc., 25%; LukArco B.V., 5%)	Tengiz and Korolev fields	NA[5]
		Karachaganak Petroleum Operating B.V. (BG Group plc., 29.25%; ENI S.p.A., 29.25%; Chevron Corp., 18%; OAO Lukoil, 13.5%; KazMunaiGas JSC, 10%)	Karachaganak field	
		CNPC AktobeMunaiGas (China National Petroleum Corp., 85.42%)	Aktobe Province	
		PetroKazakhstan Inc. (China National Petroleum Corp., 67%, and KazMunaiGas JSC, 33%)	South Turgai basin	
		Mangistaumunaigaz JSC	Mangistau Province	
		Ozenmunaigas (KazMunaiGas JSC)	do.	
		Embamunaigas (KazMunaiGas JSC)	Western Kazakhstan	
		JV Kazgermunai LLP (KazMunaiGas JSC)	Kyzylorda Province	
		JSC Karazhanbasmunai (CITIC Group and KazMunaiGas JSC)	Mangistau Province	
		North Buzachi oilfield	do.	
		Additional producers	NA	
Refined, crude oil throughput	42-gallon barrels per day	JSC Pavlodar Oil Chemistry Refinery (KazMunaiGas JSC, 58%)	Pavlodar	120,000
Do.	do.	Atyrau refinery (KazMunaiGas, 99.49%)	Atyrau	100,000
Do.	do.	PetroKazakhstan Inc. (China National Petroleum Corp., 67%, and KazMunaiGas JSC, 33%)	Shymkent	110,000
Phosphate rock, beneficiated		Chulaktau mining and processing complex (Kazphosphate LLC)	Chulaktau, Zhambyl Province	NA
Do.		Karatau mining and processing complex (Kazphosphate LLC)	Zhanatas, Zhambyl Province	NA
Do.		Temir Service LLP (Sunkar Resources plc)	Chilisai deposit, northwestern Kazakhstan	400
Rare-earth metals, products		SARECO (AO NAK Kazatomprom and Sumitomo Corp.)	Stepnogorsk	1,500
Rhenium:				
Ammonium perrhenate (containing 69.2% Re)		Zhezkazganredmet (RedMet) (Government owned)	Jezkazghan, Karagandy Province	NA
In tailings from copper ore processing		Balkhash copper mining-metallurgical complex (Kazakhmys plc)	Karagandy Province	NA
Silicon, metal		Silicium Kazakhstan LLP	Karaganda	12,500
Silver, refined		Facilities:	Locations:	1,000[5]
		Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	
		Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International plc, 69.61%)]	Oskemen (also known as Ust-Kamenogorsk)	
		Balkhash refinery (Kazakhmys plc)	Karagandy Province	
Tantalum, metal		Ulba Metallurgical Plant JSC (Kazatomprom JSC)	Oskemen (also known as Ust-Kamenogorsk)	NA
Titanium:				
Ore		Tioline LLP	Obuhovskoye deposit, just north of Kokshetau, Akmola Province	NA
Do.		Satpaevsk Titanium Mines Ltd. (Ust-Kamenogorsk titanium-magnesium plant, 49%)	Bektemir deposit, East Kazakhstan Province	NA
Do.		Shokash deposit	Aktobe Province	NA
Metal (sponge)		AO Ust-Kamenogorsk titanium-magnesium plant (UKTMK)	Oskemen (also known as Ust-Kamenogorsk)	35,000

See footnotes at end of table.

TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Uranium, U content	Companies:	Locations:	19,500 [5]
	Akbastau JV (Kazatomprom JSC, 50%, and Uranium One Inc., 50%)	Blocks 1, 3, and 4 of the Budenovskoye deposit, Sozak Region, South Kazakhstan Province	
	Appak LLP (Kazatomprom JSC, 65%; Sumitomo Corp., 25%; Kansai Electric Power Co. Inc., 10%)	West Mynkuduk Mine of the Mynkuduk deposit, Sozak Region, South Kazakhstan Province	
	Baiken-U LLP (Kazatomprom JSC, 60%, and Japanese consortium, 40%)	Block No. 2 of the Kharassan deposit, Zhanakorgan Region, Kyzylorda Province	
	Betpak Dala JV (Uranium One Inc., 70%, and Kazatomprom JSC, 30%)	Akdala Mine and Site No. 4 (South Inkai) Mine of the Inkai deposit, Sozak Region, South Kazakhstan Province	
	Inkai JV (Cameco Corp., 60%, and Kazatomprom JSC, 40%)	Blocks 1, 2, and 3 of the Inkai deposit, Sozak Region, South Kazakhstan Province	
	Karatau LLP (Kazatomprom JSC, 50%, and Uranium One Inc., 50%)	Block No. 2 of the Budenovskoye deposit, Sozak Region, South Kazakhstan Province	
	Katco JV (Areva Group, 51%, and Kazatomprom JSC, 49%)	Tortkuduk Mine and Block No. 1 of the South Moinkum deposit, Sozak Region, South Kazakhstan Province	
	JSC Ken Dala.kz (Kazatomprom JSC, 100%)	Central Mynkuduk deposit, Sozak Region, South Kazakhstan Province	
	Kyzylkum LLP (Japanese consortium, 40%; Uranium One Inc., 30%; Kazatomprom JSC, 30%)	Block No. 1 of the Kharassan deposit, Zhanakorgan Region, Kyzylorda Province	
	Mining Company LLP (Kazatomprom JSC, 100%):		
	Mining Group No. 6 LLP	North and South Karamurun Mines, Shieli and Zhanakorgan Regions, Kyzylorda Province	
	Stepnoye Mining Group LLP	Uvanas and East Mynkuduk Mines, Sozak Region, South Kazakhstan Province	
	Taukent Mining Chemical Plant LLP	Kanzhugan and South Moinkum Mines, Sozak Region, South Kazakhstan Province	
	Semizbai-U (Kazatomprom JSC and its subsidiary, Mining Company LLP, 51%, and China Guangdong Nuclear Power Group, 49%)	Irkol Mine in Kyzlorda Province and Semizbai Mine, on the border of North Kazakhstan and Akmola Province	
	Stepnogorsk Mining-Chemical Complex LLP (Kazatomprom JSC, 100%)	Shantobe Mine of the Vostok and Zvezdnoe deposits, 300 kilometers west of Stepnogorsk	
	JV Zarechnoye JSC (Kazatomprom JSC, 49.67%, and JSC Atomredmetzoloto, 49.67%)	Zarechnoye and South Zarechnoye deposits, Olrarski Region, South Kazakhstan Province	

See footnotes at end of table.

TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Zinc:			
Mine output, Zn content	Kazakhmys plc:		
	East Region complex:		
	Artemyevsky Mine	East Kazakhstan Province	90,000
Do.	Belousovsky Mine	do.	NA
Do.	Irtyshsky Mine	do.	18,000
Do.	Nikolaevsky Mine	do.	20,000
Do.	Orlovsky Mine	do.	78,200
Do.	Yubileyno-Snegirikhinsky Mine	do.	16,500
Do.	Central Region complex: Abyz Mine	Karagandy Province	13,500
Do.	Kazzinc JSC (Glencore International plc, 69.61%):		
	Ridder complex:		
	Ridder-Sokolny Mine	East Kazakhstan Province	NA
Do.	Shubinsky Mine	do.	4,000
Do.	Tishinsky Mine	do.	65,000
Do.	Shaimerden deposit	Kostanay Province	NA
Do.	Zyrianovsk complex: Maleevsky Mine	do.	135,000
Do.	TOO Nova Zinc (JSC Chelyabinsk zinc plant)	Akshatau, Karagandy Province	NA
Do.	TOO ShalkiyaZinc Ltd.	Kyzylorda Province	NA
Concentrate, Zn content	Kazakhmys plc:		
	East Region complex:		
	Artemyevsky concentrator	do.	55,000
Do.	Belousovsky concentrator	do.	5,800
Do.	Irtyshsky concentrator	do.	11,000
Do.	Nikolaevsky concentrator	do.	36,000
Do.	Orlovsky concentrator	do.	60,000
Do.	Karaganda Region complex: Karagaily concentrator	Karagandy Province	8,000
Do.	TOO Nova Zinc (JSC Chelyabinsk zinc plant)	Akshatau, Karagandy Province	35,000
Do.	TOO ShalkiyaZinc Ltd.	Kyzylorda Province	NA
Do.	Kazzinc JSC (Glencore International plc, 69.61%):		
	Ridder concentrator	do.	NA
Do.	Zyrianovsk concentrator	Zyryanovsk, East Kazakhstan Province	NA
Metal	Kazzinc JSC (Glencore International plc, 69.61%):		
	Ridder zinc refinery	East Kazakhstan Province	110,000
Do.	Ust-Kamenogorsk metallurgical complex	do.	190,000

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do., Ditto. NA Not available.

[1] Table includes data available through December 26, 2015.

[2] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3] GOK is the abbreviation for gorno-obogatitelnyi kombinat, which translates as "mining and beneficiation complex."

[4] Kazakhmys plc was restructured and renamed KAZ Minerals plc. in October 2014.

[5] Capacity estimates are totals for all enterprises that produce that commodity.

[6] It is unknown which, if any, rare metals are still being produced at this facility.

THE MINERAL INDUSTRY OF KOSOVO

By Sinan Hastorun

Kosovo is a relatively young, landlocked country in the central Balkan Peninsula that borders Albania, Macedonia, Montenegro, and Serbia. Despite its small size, the country has substantial mineral resources of cobalt, nickel, lead, lignite, silver, and zinc. Kosovo's territory is geologically composed of various sedimentary, magmatic, and metamorphic formations that contain deposits of aggregates and construction materials, bauxite, chromium, lead, magnesite, nickel, silver, and zinc. The country also has substantial hydropower and wind energy potential. The eastern Vardari Zone in the north forms the most important mineral zone and hosts the Trepca lead, silver, and zinc mines, which provided the majority of mineral production in the former Yugoslavia until its disintegration in 1990 (Independent Commission for Mines and Minerals, 2005b, c; 2011, p. 3; World Bank, The, 2011, p. 4; Ministry of Economic Development, 2014c; U.S. Department of State, 2015, p. 3; World Bank, The, 2015a, p. 10).

In 2014, Kosovo's mineral output was small by regional and world standards. The shares of mining and quarrying and manufacturing sectors in the country's gross domestic product (GDP) continued to be significantly below their past levels in the 1980s as a result of the deindustrialization and the accompanying loss of capacity that began in 1990 owing to political instability and the consequent armed conflict between ethnic Albanians and Serbs. Mineral commodity production increased significantly, from a relatively low base, in the years following Kosovo's declaration of independence in 2008. With the exception of cement, ferronickel, and steel plants, and marble quarries, which received foreign direct investment (FDI) from European countries and Israel, other mines and production facilities lacked the funding and technological upgrades necessary to resume or increase production. The legal ownership status of the Kosovo's most important mineral facility, the Trepca Mining Complex, remained unresolved as of yearend 2014 despite earlier plans to privatize it in order to revive lead and zinc output in the country. Kosovo remained reliant on lignite coal for power generation and energy consumption (Muhamet and others, 2010, p. 4; Kosovo Investment and Enterprise Support Agency, 2013; Kittner and others, 2014, p. 2; Group for Legal and Political Studies, 2015, p. 28; World Bank, The, 2015a, p. 10).

Minerals in the National Economy

In 2014, Kosovo's real GDP increased by 2.7%, which was a lower rate of growth than that of 2013. The nominal GDP in 2014 was $7.27 billion, which was up from $7.07 billion (revised) in the previous year. Kosovo's 5-year average economic rate of growth of 3.5% was the highest among the Western Balkan countries of Albania, Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, and Serbia, although the economy continued to experience a high current account deficit and high unemployment. Economic growth was based mainly on increased consumption, while there was a reduction in investment, particularly in FDI, and net exports (defined as exports minus imports) (Central Bank of Kosovo, 2015, p. 21, 25; International Monetary Fund, 2015, p. 4; World Bank, The, 2015a, p. 4; 2015b).

Mining and quarrying accounted for 2.3% of the GDP in constant prices in 2014 compared with 2.5% in 2013, while manufacturing accounted for 10.9% compared with 11.0% in 2013. The real rate of growth of the mining and quarrying industry varied greatly during the year, registering 20.6% in the first quarter, which was followed by -13.5% in the second, -7.4% in the third, and -0.9% in the fourth quarter of 2014. The contraction of mineral-related activity after the first quarter of 2014 was attributable to strikes that affected the industry and to a 46% decrease in FDI inflows owing in part to an uncertain investment climate caused by the lack of a new Government in the second half of the year (Central Bank of Kosovo, 2015, p. 29; Kosovo Agency of Statistics, 2015b, p. 5, 6; U.S. Department of State, 2015, p. 6; World Bank, The, 2015a, p. 4).

The value of Kosovo's total exports in 2014 was €324.6 million ($414.0 million[1]), compared with $375.2 million (revised) in 2013. The almost 11% increase in the value of exports was mainly attributable to the increase in the value of exports of base metals, which continued to be the leading export category. The value of Kosovo's total imports in 2014 was $3.237 billion compared with $3.128 billion (revised) in 2013. Kosovo's trade deficit increased by 2.7% to $2.824 billion in 2014 from $2.753 billion in 2013, but the ratio of exports to imports increased slightly to 12.8% from 12% in 2013 (Central Bank of Kosovo, 2015, p. 28; Kosovo Agency of Statistics, 2015a, p. 7).

Mineral commodities were the leading export and import goods of Kosovo, although mineral imports decreased in terms of value in 2014. Ferronickel, lead, scrap metal, zinc, and industrial minerals, such as dimension stone, continued to be the leading sources of export revenue for the country's economy. Exports of base metals and articles thereof totaled about $189.5 million, or about 46% of the total value of all exports. Exports of mineral products, which included industrial minerals, mineral fuels, and metal ores, but not processed metals, were valued at $57.0 million and made up about 14% of the total value of all exports. Exports of mineral fuels were valued at $31.8 million and accounted for 7.7% of exports. Mineral product imports were valued at about $596.7 million and accounted for about 18% of the total value of all imports. Imports of base metals and articles thereof were valued at $290.7 million and made up about 9% of total imports. Imports of mineral fuels were valued at $473 million and accounted for 14.6% of imports. Imports of precious metals were valued at $2.3 million and made up less than 0.1% of total imports (Central Bank of Kosovo, 2015, p. 28; Kosovo Agency of Statistics, 2015a).

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[1] Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US$) at an average rate of €0.784=US$1.00 for 2014 and €0.783=US$1.00 for 2013.

Kosovo's main trading partners were the European Union (EU) countries, which accounted for approximately 43% of imports and 14% of exports, and the neighboring states of the Central European Free Trade Agreement (CEFTA), such as Albania, Bosnia and Herzegovina, Macedonia, Montenegro, and Serbia, which accounted for a 28% share of imports and a 36% share of exports. In 2014, Kosovo's exports to the United States were valued at $586,000, which included $38,000 in bauxite and aluminum. Kosovo's imports from the United States were valued at $16.3 million; the country's only mineral import from the United States was fertilizers valued at $118,000 (Kosovo Agency of Statistics, 2015a, p. 8; U.S. Census Bureau, 2015a, b; U.S. Commercial Service, 2015, p. 1).

Government Policies and Programs

Three Government agencies are broadly responsible for the mineral sector in Kosovo: the Independent Commission for Mines and Minerals (ICMM), the Ministry of Economic Development, and the Ministry of Environment and Spatial Planning. The ICMM is an independent regulatory agency that is responsible for implementing mining laws, regulations, and policies. It is in charge of (1) the issuance, transfer, suspension, and revocation of exploration and mining licenses and permits in Kosovo, and (2) the establishment and maintenance of the official mining register and the geographic information system (GIS) database of relevant geological and economic data for Kosovo. The Ministry of Economic Development is responsible for formulating legislation, policies, and strategies for mine development and for promoting new mineral research and exploitation in the country. It also regulates the mineral sector by setting standards and implementing regulations on safety and environmental protection. The Ministry of Environment and Spatial Planning evaluates Environmental Impact Assessments (EIA) submitted by companies, which report on the potential effects of mining projects, and is responsible for issuing Consents concerning mineral exploitation, which are required for the issuance of a license by the ICMM. An exploration license requires approval by the ICMM only, while an exploitation license requires the consent of the Ministry of Environment and Spatial Planning, the municipality, and the Ministry of Agriculture, Forestry and Rural Development if the licensed area is located in or close to a forest. A fourth agency, the Privatization Agency of Kosovo (PAK), also has an important function in the mineral sector; it is in charge of selling state-owned enterprises to private investors by issuing calls for tenders, including for major metal and other mineral production plants (Independent Commission for Mines and Minerals, 2005a; 2011, p. 5; World Bank, The, 2011, p. 11, 12, 13; Privatization Agency of Kosovo, 2014a; Western Balkans Investment Framework, undated).

Law No. 03/L–163 (on mines and minerals) of 2010 is the principal law governing mineral activity in Kosovo. The law created zones of special interest for exploration and extraction of such key minerals as bauxite, chromite, lead, magnesite, nickel, and silver. In 2013, it was supplemented by law No. 04/L–158 (on amending and supplementing law No. 03/L–163), which simplified the process for obtaining a mining license. In addition, the 2011 Public Private Partnership (PPP) law No. 2011/04–L–045 opened major sectors of Kosovo's economy to FDI by harmonizing bidding procedures and investment regulations with the laws and regulations of the EU. In 2013, law No. 2013/04–L–220 defined fundamental rights and established ownership guarantees for foreign investors in accordance with international laws and standards. In 2014, law No. 04 L–232 (on Kosovo Geological Service) was passed to establish the Kosovo Geological Service, which would perform geologic research and update the Mining Cadastre and GIS of ICMM. The energy sector is regulated by the Energy Regulatory Office (ERO), which was established in 2004 and operated under law No. 03/L–185 (on the energy regulator) of 2010 to monitor the supply of electricity, heat, and natural gas, in accordance with law No. 03/L–184 (on energy) of 2010. The distribution, transmission, supply, usage, and storage of natural gas is regulated by law No. 03/L–133 (on natural gas) of 2009 (Ministry of Economic Development, 2014a, b; Institute for Development Research (RIINVEST), 2015, p. 13; U.S. Department of State, 2015, p. 4).

Production

Total production of lead concentrate and zinc concentrate for Kosovo from 2010 through 2014 includes output from the northern and southern sections of the Trepca Complex, which is located near Mitrovica in northern Kosovo. The northern section, which covers about 30% of the divided complex, was reported in 2012 to have produced 11,000 metric tons (t) of lead concentrate and almost 8,000 t of zinc concentrate, which represented only 15% of capacity. These figures have been added to production reported by the Kosovo Government-controlled southern section of the mine (table 1; Filipovic, 2013; Tanjug, 2015).

The production of lead and zinc ore in the southern section of the Trepca Complex increased by nearly 12% in 2014. Individual production data from the two main mines of Trepca, the Stan Terg Mine and the Artana Mine, were unavailable for the whole of the year of 2014. Total ore extracted in the first half of the year was 67,859 t in the Stan Terg Mine and 27,622 t in the Artana Mine. The average production from 2000 through 2013 was 82,211 metric tons per year (t/yr) in Stan Terg and 26,642 t/yr in Artana. The Trepca Complex as a whole was estimated to have operated at only one-fourth of its production capacity in 2014 (U.S. Agency for International Development, 2013, p. 11; Group for Legal and Political Studies, 2015, p. 13, 14, 15, 16).

In 2014, the production of silica sand increased more than threefold; iron and steel, by an estimated 25%; ferronickel (Ni content), by an estimated 18%; basalt, by 13%; cement, by an estimated 13%; lead (concentrate, gross weight), by 10%; and clay, by 10%. The production of dunite decreased by 88%; andesite, by 83%; marl, by 24%; and nickel (Ni content) and lignite coal, by 12% each. Chromite and pumice output remained at zero in 2014 (table 1).

Structure of the Mineral Industry

The leading private mineral production companies were Newco Ferronikeli, which operated a nickel mining and smelting complex in Glogovac (owned by Cunico Resources NV of Israel); Sharrcem Sh.p.k., a cement manufacturing and limestone mining company in Hani i Elezit (owned by Titan Group of Greece); and Llamkos GalvaSteel, a steel manufacturer in Vushtrri (owned by Core Group of Russia). All three mineral facilities had foreign ownership as a result of privatization completed in 2005, 2010, and 2011, respectively. Lignite was produced by the Government-owned Kosovo Energy Corp. JSC (KEK), which was also the primary power generator in the country. KEK's energy distribution and supply arm, however, was owned by the Limak-Calik consortium of Turkey after it was privatized in 2012 as Kosovo Electricity Distribution and Supply Company (KEDS). From September 2013 through March 2014 (the latest time period for which detailed data were available), 17 new companies were registered in mining and quarrying and accounted for 0.33% of the total number of new companies. During the same period, four mining and quarrying companies closed (table 2; Privatization Agency of Kosovo, 2014b, p. 21, 22; Republic of Kosovo Government, 2014, p. 33, 34; Uberti, 2014, p. 488; Institute for Development Research RIINVEST, 2015, p. 19; U.S. Department of State, 2015, p. 5).

The Trepca Complex remained in a trust administered by the PAK and operated under a 2006 moratorium on the sale, removal, transfer, or rent of its assets as of yearend 2014. The Ministry of Economic Development had proposed in 2011 that Trepca's mines and processing operations be converted from socially owned enterprises (SOEs) into privately owned enterprises (POEs) in order to revitalize mineral commodity production. The privatization of these assets was put on hold in 2012, however, owing to complications that arose from unclear ownership stakes, unsettled debts, and opposition to the sale and transfer of ownership by the Government of Serbia, which also claimed ownership of the complex. In November 2013, the PAK announced a public tender for professional service providers to prepare the Reorganization Plan for Trepca, which would be submitted to the Special Chamber Court of the Supreme Court of Kosovo in July 2014. In September 2014, however, the PAK informed the Supreme Court that it was unable to comply with the obligation to submit a restructuring plan that would address outstanding creditor claims and privatize the complex because the tender had been annulled. In January 2015, the Supreme Court ruled that liquidation proceedings could be initiated against Trepca if the PAK did not submit the reorganization plan by February (Karadaku, 2012; Privatization Agency of Kosovo, 2014c, p. 47; Bytyci, 2015; Group for Legal and Political Studies, 2015, p. 25, 28; U.S. Commercial Service, 2015, p. 5).

As of April 2014, there were a total of 427 mineral licenses in effect in Kosovo, of which 117 were issued by the ICMM for exploration, 193 for extraction, and 117 for specific activities, such as reparation. In 2013 (the last year for which detailed data were available), of 297 applications submitted for new licenses, 178 were granted: 67 were exploration licenses; 52, extraction licenses; and 59, permits for specific activities. Of exploration licenses, 38 were for dimension stone; 20, for metals; 6, for industrial minerals; and 3, for silica sand. Most extraction licenses were issued for dimension stone. Only eight new extraction licenses were issued for metals, of which four were granted to the Trepca administration (Artana, Belo Brdo, Crnac, and Stan Terg), and two to Newco Ferronikeli (Glogovac and Lipjan). Only three new extraction licenses were issued for industrial minerals, one of which was granted to Sharrcem (Kacanik) (Independent Commission for Mines and Minerals, 2014a; b, p. 56, 59, 64)

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Chromium.—Arsi Sh.p.k. Ltd., which was the only chromite exploration company in Kosovo, held five exploration licenses and one extraction license in Kosovo as of April 2014. The company began production of chromite through open pit mining at the Briu i Gjeletocit deposit on its Llapceve property in 2012, with a projected goal of producing 100,000 t/yr at 30% chromium oxide (Cr_2O_3). Arsi reported production of 1,700 t of chromite ore at 26% to 30% Cr_2O_3 for the first three quarters of 2012. No production was reported for 2013 and 2014. No further updates were available for the Llapceve property (Arsi Sh.p.k., 2013, p. 2, 3, 8, 9; Independent Commission for Mines and Minerals, 2014a, p. 1, 2, 3).

Ferronickel and Nickel.—The production of ferronickel and nickel each increased by 18% in 2014 compared with that of 2013. Newco Ferronikeli, which was the only producer of ferronickel and nickel in Kosovo, reported that annual ferronickel output at its Glogovac plant was expected to exceed 9,000 t in 2014 owing to a new investment in equipment, and to eventually reach 12,000 t in a few years. It was estimated that only about one-half of the nickel ore processed at the plant was supplied by the adjacent Chikatovo and Glavitza Mines, which were also owned by Cunico Resources. The remaining 50% of input was made up of imports from Albania, Turkey, and East Asian countries (Cunico Resources NV, 2014; Uberti, 2014, p. 497).

Gold and Silver.—In April 2014, Avrupa Minerals Ltd. of Canada entered into a joint venture with Byrnecut International Ltd. of Australia for the Slivovo gold and silver project, which is located about 15 kilometers southeast of Prishtina. In December 2014, Avrupa Minerals reported that drilling intercepted rocks at 126.5 meters that assayed 6.2 grams per ton (g/t) gold, 15.0 g/t silver, 0.092% copper, 0.16% lead, and 0.45% zinc. The company completed drilling seven holes in the Peshter Gossan target area from April through December 2014 and expected to obtain results from two subsequent drill holes in January 2015 (Avrupa Minerals Ltd., 2014a, b; 2015).

Iron and Steel.—Core Group, which was the owner of Llamkos GalvaSteel, was in the process of building a steel-recycling mill in Vushtrri since March 2013 in order to begin production of rebar (reinforcing steel bars). When completed, the mill would have the capacity to convert 210,000 t/yr of billets into rebar using a 40-metric-ton-per-hour reheating furnace, a rolling-mill ladle car, a water-quenching system, and shearing and bundling equipment. Core Group also planned to increase the melting capacity from 160,000 t/yr in the near future to produce more steel billets from steel scrap, but would rely on other sources in the meantime. Rebar production was originally planned to begin in the spring of 2014, but no further updates were available as of yearend 2014 (Core Group, 2013; Steel Business Briefing, 2013).

Industrial Minerals

Cement.—In 2014, Sharrcem, a subsidiary of the TITAN Group of Greece, had a 70% share of the cement market in Kosovo. Cement consumption in the country increased to 0.9 million metric tons (Mt) in 2014 from 0.8 Mt in 2013, of which 30% was imported mainly from other Balkan countries, such as Albania and Macedonia. Capacity utilization at Sharrcem's cement plant in Hani I Elezit was estimated to have increased to 74% in 2014 from 67% in 2013. In 2012, TITAN Group received a $64 million equity investment from the International Finance Corporation to support its subsidiaries in Kosovo, Macedonia, and Serbia. This investment helped the three companies, which had a total capacity of about 3.5 million metric tons per year, to improve their energy efficiency and environmental quality, and to increase their vertical integration. In August 2014, Sharrcem was acquitted of the charge of abuse of its dominant position in the Kosovo cement market, which had been brought against the company by the Kosovo Competition Authority in 2012 (International Cement Review, 2012; TITAN Group, 2015a, p. 107; b, p. 32, 33).

Limestone.—Fox Marble Holdings plc of the United Kingdom, a leading marble quarrying and extraction company in Kosovo, in December 2014 signed a $1.9 million sales deal with a Gibraltar-based customer to deliver three marble shipments over an 18-month period. The company was also in negotiations to export marble to China, India, and Italy. Fox Marble extracted about 14,000 t of marble in 2014 from its three operational quarries, of which 6,500 t was quarried in Cervenilla, 6,000 t in Syrigane, and 1,500 t in Malesheva. The Malesheva quarry, which produced Bianco Illirico marble for which demand was particularly strong in North America, was expected to reach full commercial production in 2015. Fox Marble was building a double-skinned steel plant for the cutting and processing of stone blocks into polished tiles and slabs for exporting in Lipjan, which is close to the Prishtina airport. The Lipjan plant was expected to begin operating in 2015 (Proactive Investors, 2014; Fox Marble Holdings plc, 2015, p. 3, 5, 6, 8).

Mineral Fuels and Related Materials

Coal remained the only mineral fuel produced in Kosovo. All petroleum and petroleum products were imported, mainly from Greece, Italy, and Macedonia. There was no production, consumption, or importation of natural gas. In 2013 (the latest year for which detailed data were available), coal made up 65.3% of the country's primary energy supply. Petroleum and petroleum products accounted for 23.6%; biomass, 10.2%; imported electricity, 0.5%; and hydropower, 0.4%. Coal provided 97% of domestic electricity generation, while hydropower accounted for only 3% of electricity. The Government's National Renewable Energy Action Plan (NREAP) of 2013 planned to increase the share of renewable energy sources, such as hydropower, wind, and solar energy, in electrical energy generation to 8% by 2016 and in gross final energy consumption to 25% by 2020 (Energy Regulatory Office, 2013, p. 22, 25; Ministry of Economic Development, 2013, p. 6; European Commission, 2014, p. 4; United Nations Development Programme, 2014a, p. 11; 2014b, p. 2).

Coal.—Kosovo's proven lignite reserves were estimated to be about 14.7 billion metric tons, most of which were considered minable. The country's major lignite basins were the Dukagjini basin and the Kosovo basin, which included the major Sibovc deposit with a high average stripping ratio. Lignite continued to be the major source of domestic power generation in the country, but it had low energy content, averaging 2.2 kilowatthour per kilogram of lignite, which limited its use to large-scale powerplants (Independent Commission for Mines and Minerals, 2005b; World Bank, The, 2011, p. 4; Kosovo Civil Society Consortium for Sustainable Development, 2014, p. 9).

Almost all electricity generation capacity in Kosovo came from two old lignite-fired thermal powerplants operated by KEK—Kosovo A and Kosovo B, whose available capacity and net output were low and emissions of moisture and ash were high. In June 2014, the 40-year-old Kosovo A powerplant had a major explosion that temporarily shut down the country's entire power system. The Government's Energy Sector Strategy aimed to decommission the Kosovo A powerplant by 2017 to comply with the Energy Community Treaty, to rehabilitate the Kosovo B powerplant to comply with EU environmental standards, and to construct new electricity generation capacity with private sector investment. In 2014, in order to achieve the latter goal, the Government issued a tender for a new 600-megawatt-capacity coal-fired powerplant, Kosovo C, and a new lignite mine to be constructed near the capital city of Prishtina (World Bank, The, 2010, p. 7; European Bank for Reconstruction and Development, 2014; European Commission, 2014, p. 4; Kosovo Civil Society Consortium for Sustainable Development, 2014, p. 9; U.S. Department of State, 2015, p. 5).

Outlook

Kosovo is expected to remain a modest producer of mineral commodities, but it is likely to continue increasing its cement, dimension stone (marble), ferronickel, nickel, and steel output owing to new business investments and improvements in operational efficiency. Exploration for gold and silver is at an early stage and is not expected to lead to precious-metal extraction in the country soon. The Trepca Complex has the potential to become a regionally significant producer of lead and zinc, but this would require major investment in the mines and the resolution of multiple ownership and creditor claims, neither of which seems likely to happen in the near future. Similarly, Kosovo's significant reserves of lignite could make it a leading producer of coal in the world, but this would depend on global demand as well as the opening of new mines for extraction. The country is expected to increase its renewable energy production in the coming years, but it is likely to continue to rely on lignite coal to meet most of its energy needs for the foreseeable future.

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TABLE 1
KOSOVO: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Chromium, chromite ore, 26% Cr_2O_3		--	--	1,700 [r]	-- [r]	--
Ferroalloys:						
Ferronickel, gross weight[e]		38,200	41,000	30,200	33,300 [r]	39,100
Ni content[3]		8,790	9,435	6,944	7,652 [r]	9,000 [e]
Iron and steel	thousand metric tons	--	--	120 [e]	120 [e]	150 [e]
Lead and zinc:						
Ore, gross weight		185,842	233,115	225,490	252,768	282,254
Mine output, Pb content		7,700	7,100	6,700	7,400	7,900
Mine output, Zn content		6,400	6,600	6,600	7,100	7,700
Concentrate:						
Lead:						
Concentrate, gross weight		19,232	18,471	19,298	20,025	22,045
Pb content		13,400	11,200	12,300	14,200	15,300
Zinc:						
Concentrate, gross weight		16,678	15,409	17,695	18,417	19,696
Zn content		7,900	6,000	7,000	8,800	9,300
Nickel:						
Ore, wet, gross weight		779,506	683,855	379,151	623,504	565,056
Mine output, Ni content		9,100	7,700	4,400	7,600	6,700
INDUSTRIAL MINERALS						
Andesite	cubic meters	NA	NA	34,057	14,410 [r]	2,500
Basalt	do.	--	--	8,743	9,705	10,964
Cement[e]	thousand metric tons	420 [r]	420 [r]	535	560 [r]	630
Clay[4]		22,900	38,800	55,300	50,100	55,300
Dunite	cubic meters	--	--	95,284	1,783,317	206,117
Limestone	do.	2,606,047	3,282,964	2,666,449	5,215,997 [r]	4,816,882
Marl	do.	302,630	259,616	128,161	411,073	310,953
Pumice and related materials, volcanic tuff[e]	do.	60,000	60,000	--	--	--
Sand and gravel, excluding glass sand	do.	18,533	32,819	22,749	25,399 [r]	26,142
Silica sand (glass sand)	do.	25,178	19,711	22,490	27,371	120,668
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite	thousand metric tons	7,958	8,212	8,028	8,219	7,204

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through July 24, 2015.

[2] In addition to the commodities listed, other aggregates and construction materials were thought to have been produced, but available information is inadequate to make reliable estimates of output.

[3] About 50% of the nickel ore processed for ferronickel production in Kosovo was imported from other countries.

[4] Converted based on reported production in cubic meters: 2010—38,925; 2011—65,930; 2012—94,008; 2013—85,134; and 2014—93,924.

TABLE 2
KOSOVO: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Bauxite	Bauxite Mine Volljak (Government owned)	Grebnik Mine, about 50 kilometers east of Pristina and 17 kilometers north of Orahovac	NA
Cement	Sharrcem Sh.p.k. [Sharr Beteiligungs GmbH (Titan Group)]	Cement plant in Hani i Elezit, on border with Macedonia	835
Chromite	Arsi Sh.p.k. Ltd.	Llapceve, about 12 kilometers north of Rahovec	NA
Coal, lignite	Kosovo Energy Corp. JSC (Government owned)	Bardh and Mirash Mines, just west of Pristina	NA
Iron and steel	Llamkos GalvaSteel (Core Group)	Steel plant in Vushtrri, northeastern Kosovo	210
Kaolin	NA	Karaceva i Ulte Mine and ceramic tile factory in Kamenica	NA
Lead and zinc:			
Ore	Trepca Complex (Government owned)	Stan Terg Mine	NA
Do.	do.	Crnac Mine, northern Kosovo	NA
Do.	do.	Artana Mine at Novo Brdo	NA
Do.	do.	Belo Brdo Mine, northern Kosovo	NA
Do.	do.	Cicavica Mine, northern Kosovo	NA
Do.	do.	Hajvalia Mine, 8 kilometers southeast of Pristina	NA [1]
Concentrate	do.	Concentrator at Tuneli i Pare, near Mitrovica	NA
Do.	do.	Concentrator at Kizhnica, about 8 kilometers southeast of Pristina	NA
Do.	do.	Concentrator at Leposavic in northern Kosovo	NA
Do.	Trepca Complex (Serbian controlled)	Concentrator in northern Mitrovica	126
Metal:			
Lead	do.	Lead smelter at Zvecan	NA
Zinc	do.	Zinc smelter at Mitrovica	NA
Limestone	Fox Marble Holdings plc	Cervenilla, Malesheva, Rahovec, and Syrigane quarries	20
Do.	Sharrcem Sh.p.k. [Sharr Beteiligungs GmbH (Titan Group)]	Hani i Elezit Mine, on border with Macedonia	NA
Magnesite[2]	XIM Strezoc Magnesite Mine LLC ("Iminggrup mgo" Sh.p.k.)	Mine and processing plant in Strezovce, Kamenica municipality	45
Do.	Mine and Industry of Magnesite Goleshi LLC ("Iminggrup mgo" Sh.p.k.)	Magure, Lipljan municipality	NA
Nickel:			
Ore	Newco Ferronikeli (Cunico Resources NV)	Mines at Chikatovo (Dushkaja and Suke Mines) and Glavitca	NA
Metal[3]	do.	Ferronickel plant at Glogovac, about 20 kilometers west of Pristina	12

[e] Estimated. Do., do. Ditto. NA Not available.

[1] The Hajvalia Mine was flooded and has not produced any lead-zinc ore since the late 1990s.

[2] There were no active magnesite mines in Kosovo in 2014.

[3] Nickel in ferronickel.

THE MINERAL INDUSTRY OF KYRGYZSTAN

By Karine M. Renaud

Kyrgyzstan is a landlocked mountainous country with limited transportation and energy infrastructure. The country ranked second in the world in mercury production in 2014, accounting for 3% of total world production. Gold remained the primary mineral (in terms of value) mined in Kyrgyzstan. Other mineral commodities mined in the country were clay, coal, fluorspar, gypsum, lime, natural gas, crude petroleum, sand and gravel, sand, and silver. The country's undeveloped mineral resources included bauxite, copper, iron ore, lead, rare earths, sulfur, tin, tungsten, and zinc (table 1; AZoMining, 2013; George, 2016).

Minerals in the National Economy

Kyrgyzstan's real gross domestic product (GDP) decreased by 3.6% in 2014 compared with an increase of 10.9% (revised) in 2013 owing to the reduction in gold production. The nominal GDP was $6.74 billion[1] in 2014. The value of industrial output decreased by 1.4% compared with an increase of 20% in 2013. Mineral industry output, by value, increased by 7% to $98 million in 2014 from $92 million in 2013. The country had 485 mining enterprises, of which 8 were owned by the Government, 1 was owned by a municipality, and 476 were owned privately (National Statistical Committee of the Kyrgyz Republic, 2014, p. 82, 87, 89, 91; 2015, p. 71, 73; Asian Development Bank, 2015, p. 124).

Government Policies and Programs

According to a draft agreement that was approved in May 2014, Kyrgyzstan was expected to join the Eurasian Economic Union (EAEU) in January 2015. EAEU is an international economic integration union whose members include Belarus, Kazakhstan, and Russia. The EAEU was created to establish a customs union for the member countries to strengthen their economies and increase their competitiveness in the global market (Ereport.ru, 2014; Tengri News, 2014).

On April 23, 2014, the Parliament passed the "Glacier Law," which prohibits activities that cause damage to glaciers and specifies that, if glaciers are damaged, the companies responsible must pay compensation at a rate determined by the Government. Centerra Gold Inc. (Centerra) of Canada, the operator of the Kumtor Mine, could be affected by the law because the Kumtor Mine bisects a glacier. The law must be signed by the Government before it takes effect; however, no signing date had been determined (Lazenby, 2014; Thomson Reuters, 2014).

In 2014, the State Agency for Geology and Mineral Resources announced an auction for the subsoil rights to the following coal- and gold-rich areas in the Naryn Region: the Karakichi gold area in the Jumgal District, the Sarykoo gold area in the Kochkor District, the Aksai coalfield in the Aktala District, and the Kashkasu brown coalfield in the Jumgal District (Central Asian Countries Geoportal, 2015).

Production

In 2014, uranium production (U content) increased by 31% and coal production increased by 25%. Production of mercury decreased by 35%, and gold production decreased by 5%. Data on mineral production are in table 1 (FOR.kg, 2014).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities, their locations, and their annual capacities.

Mineral Trade

Kyrgyzstan's total value of trade in 2014 was $6.41 billion, of which exports totaled $1.46 billion compared with $1.55 billion in 2013, and imports totaled $4.95 billion in 2014 compared with $5.42 billion in 2013. In 2014, the value of gold exports was $598.5 million, which accounted for 41% of the total exports; cement (portland), $12.6 million, which accounted for 1% of total exports; coal, $6.6 million; silver, $2.7 million; and fertilizer, $2.2 million. The tonnage of exports was 2.2 million metric tons (Mt) of coal, 1.3 Mt of cement, and 34,000 metric tons (t) of fertilizer. In 2014, the major export partners, by value, were Switzerland (which received 33% of Kyrgyzstan's exports); Kazakhstan (23%); the United Arab Emirates and Russia (8% each); Uzbekistan (7%); and Turkey (5%). In 2014, the value of fertilizer imports was $67.4 million; natural gas, $43.1 million; and coal, $38.8 million. The country's major import partners, by value, were Russia (which supplied 21% of Kyrgyzstan's imports); China and Japan (5% each); and Kazakhstan (3%) (National Statistical Committee of the Kyrgyz Republic, 2014, p. 135–136, 140–142).

Commodity Review

Metals

Antimony.—The Kadamzhay mining and metallurgical complex was the sole antimony producer in the Batkenskaya Oblast'. It remained closed until mid-2014 and did not operate at full capacity in the second half of the year owing to the lack of raw materials. Previously, raw materials were delivered to the Kadamzhay complex from the Novoangarskii processing plant in Russia and from Tajikistan. The Novoangarskii processing plant was unable to provide the necessary tonnage of raw materials needed by both the Kadamzhay complex and by a new antimony processing plant in Russia owing to the limited supply of raw material at the Novoangarskii deposit (MTRK Mir, 2015; MinerJob.ru, 2013a; Sytenkova, 2014).

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[1] Where necessary, values have been converted from Kyrgyzstani soms (KGS) to U.S. dollars (US$) at an average rate of KGS58.86=US$1.00 for 2014 and KGS49.22=US$1.00 for 2013.

In 2013, several roads along the Kyrgyzstan-Tajikistan border were closed by the Kyrgyzstan Government and remained closed in 2014; these closures stopped the delivery of raw materials from Tajikistan. Since 1991, when Kyrgyzstan, Tajikistan, and Uzbekistan gained independence from the Soviet Union, the borders between the countries have not been well defined. This led to frequent clashes between civilians along the ill-defined border between Kyrgyzstan and Tajikistan (Radio Free Europe—Radio Liberty, 2013; KyrTag, 2013; FOR.kg, 2014; Sytenkova, 2014).

Copper and Gold.—As of 2013, Kyrgyzstan had 68 known gold deposits with combined resources of 565 t of gold. Only a few of the deposits were mined. Centerra, which operated the Kumtor Mine in Kyrgyzstan, was the leading Western gold-mining company operating in Central Asia. The company produced 17,657 kilograms (kg) of gold in 2014 owing to the processing of lower grades of ore from cut-back 16 (waste from an external dump) compared with the higher grades of ore processed from cut-back 15. The Kumtor Mine's total proven and probable resources were estimated to be 68.5 Mt at a grade of 2.8 grams per metric ton (g/t) gold in 2014 compared with 85.2 Mt at a grade of 3.1 g/t gold in 2013. The open pit's total measured and indicated resources were estimated to be 29.5 Mt at an average grade of 3.0 g/t gold, and the open pit's inferred resources were estimated to be 2.7 Mt at an average grade of 1.5 g/t gold. According to the Gold and Silver Sale Agreement, Government-owned OJSC Kyrgyzaltyn purchased gold dore produced at the Kumtor Mine for processing at its refinery, and Kyrgyzaltyn was responsible for delivering processed gold within 12 days of shipment (Centerra Gold Inc., 2014, p. 11, 25, 33).

On May 28, 2013, about 1,000 people from the local community went on strike, demanding nationalization of the mine and improvements in living conditions. Strikers blocked the main road that leads to the capital, Bishkek, which affected the movement of people and supplies to and from the mine. The strike caused $4 million in damage. The Prime Minister of Kyrgyzstan visited the area and announced that the Government was negotiating with Centerra. In 2013, Kyrgyzstan's Parliament approved a new joint-venture agreement between Centerra and Kyrgyzaltyn to develop the Kumtor gold field. As of 2014, the Government was still working on increasing Kyrgyzaltyn's stake in the project to 50% from 33% (BBC News, 2013; Thomson Reuters, 2013; Riseborough and Hill, 2013; Centerra Gold Inc., 2014, p. 61).

In the fourth quarter of 2014, Centerra submitted its 2015 annual mine plan and environmental impact assessment (EIA) to the Government for approval; however, the plan and the EIA were rejected owing to concerns regarding mining operations on ice-covered areas at Kumtor (Centerra Gold Inc., 2014, p. 15).

In 2014, Kyrgyzaltyn's Makmal, Tereksai, and Solton Sary Mines, which are located in the Jalal-Abadskaya Oblast', produced a total of 336 kg of gold compared with 623 kg of gold in 2013. The decrease was attributed to the lack of gold ore for extraction at the Makmal Mine and a complete stoppage of work at the Makmalzoloto complex (Mineral.ru, 2014).

In 2014, several other gold deposits were at the exploration stage, were auctioned, or were being developed. The Taldy-Bulak Levoberezhny gold mine was a joint venture between Superb Pacific Ltd. of China, a subsidiary of Zijin Mining Group (60%), and Government-owned Kyrgyzaltyn (40%); the mine is located in the Syn-Bulak Valley of the Chuiskaya Oblast'. The gold resources at the mine were estimated to have an average grade of 7.23 g/t and to contain 64,625 kg of gold. The mine, which was expected to start operations in 2014, had a production capacity of 4 metric tons per year (t/yr) of gold. The commissioning of the mine was delayed until the third quarter of 2015 owing to a lack of energy (OJSC Kyrgyzaltyn, 2011; Interfax, 2013; Kabar, 2014).

The Bozymchak copper-gold mine is located in the Ala-Buka region, Jalal-Abadskaya Oblast', and was operated by Kaz Minerals plc of Kazakhstan (Kaz Minerals) (formerly Kazakhmys Gold Kyrgyzstan LLC). The deposit contained more than 146,000 t of copper, 23,000 kg of gold, and 138,000 kg of silver. Kaz Minerals started production at the Bozymchak copper-gold mine in the first half of 2014; the mine produced 426,000 t of ore at a grade of 1% copper, and production at the mine was expected to be ramped up to a commercial level of production in 2015. The mine's operations would start as open pit mining, and the annual output was expected to be 6,000 t/yr of copper. According to the general director of Kaz Minerals, construction of a beneficiation plant was completed in 2014. The annual capacity of the beneficiation plant was expected to be 1 million metric tons per year (Mt/yr) of ore, and it would employ 180 people. The plant would produce concentrate, which would be exported to the Balhashkii smelter in Kazakhstan (Zijin Mining Group Co. Ltd., 2011; Kazakhmys Plc, 2013, p. 11, 12, 34; MinerJob.ru, 2013b; Trilling, 2013; Turusbekov, 2013; Kabar, 2014; Kaz Minerals plc, 2014, p. 4, 14).

In 2014, Mineral Resources Ltd. of Australia explored the South Kyrgyz gold project (100% ownership) on the Tien Shan gold belt. The South Kyrgyz gold project included five mines—the Mamaksai, the Obdilla, the Shambesai (which was under development), the Tolubay, and the Ulutgtau. In 2013, Manas Resources conducted a feasibility study of the Shambesai gold project. Based on the feasibility study, the Shambesai gold mine would be able to produce 2.35 Mt/yr of ore grading 3.7 g/t gold and containing 8,695 kg of gold. The total resources at the Obdilla and Shambesai projects were estimated to be 17.3 Mt of ore grading 2.2 g/t gold containing 38,060 kg of gold. The Chaarat gold project was owned by Chaarat Gold Holdings Ltd. of the British Virgin Islands. The total resources, including measured, indicated, and inferred, were estimated to be 29.5 Mt at an average grade of 3.97 g/t gold (Manas Resources Ltd., 2013, p. 13; 2014, p. 7–8; Chaarat Gold Holdings Ltd., 2014, p. 3).

Rare Earths.—Kyrgyzstan had 20 rare-earth deposits and mineralizations; one of the largest rare-earth deposits was Kutessay II, which is located in the central part of the Aktuz ore field in the Kemin region. In 2009, Stans Energy Corp. of Canada acquired 100% of OSC Kutisay Mining LLC, which held a 20-year mining license for the Kutessay II and the Kalesay deposits through its local subsidiary Stans Energy KG.

The Kutessay II deposit was under exploration from 2012 until April 2013. The total measured and indicated resources of Kutessay II were estimated to have an average grade of 0.26% of rare-earth oxides (TR_2O_3) and contain 42,980 t of TR_2O_3; additional inferred mineral resources were estimated to have an average grade of 0.20% of TR_2O_3 and contain 3,560 t of TR_2O_3 (Stans Energy Corp., 2012a, p. 26–27, 73).

In June 2012, the committee on economic sector development of the Parliament recommended to the Gosgeologagenstvo (State Geology Agency) that the extended license granted to Stans Energy be annulled on the grounds that the company did not fulfill its obligations as specified in the original and the extended licenses. Also, the committee stated that the licenses were given to Stans Energy in violation of the laws in place at the time the licenses were issued, including the Mining Code. The Gosgeolagenstvo did not annul the license but was negotiating with the company to transfer about 20% of the shares of the company to the Government. In August, the Gosgeolagenstvo confirmed the company's compliance with the licensing agreement. Also, Stans Energy filed a lawsuit against the Parliament's committee, and in November, the Inter-District Court of Bishkek ruled in favor of the company. It was not clear, however, if additional attempts to annul the licenses would be initiated (Stans Energy, 2012b, c; Safirova, 2013, p. 26.3).

As of April 2013, all work stopped at Kutessay II owing to the claim of ownership of the mining license for Kutessay II by Baotou Hongbo Technology Company Co. Ltd. of China (Baotou). In 2013, Stans Energy announced that the Bishkek City Court overruled the lower court decision and ruled that Baotou had no rights to Kutessay II. Baotou appealed the Bishkek City Court ruling to the Supreme Court of Kyrgyzstan. In 2014, Stans Energy announced that the Supreme Court had ruled against Baotou. Baotou continued to claim ownership of the mining license for Kutessay II and Kalesay and asserted that the license had been taken from it. A hearing was scheduled for December 2014 (Mineral.ru, 2012; Business Wire, 2013; Ivleva and Pak, 2013, p. 2; Stans Energy Corp., 2014).

Industrial Minerals

Cement.—In 2014, cement production in Kyrgyzstan increased by 3% to 1.73 Mt from 1.68 Mt in 2013. In 2014, two cement plants were operated by United Cement Group in northeastern Kyrgyzstan—the OJSC Kant cement plant and the LLC TechnoLin cement plant. Two other cement plants were operated by China-Kyrgyz Co. in southern Kyrgyzstan—the Aravan cement plant and the Tushtuk Kyrgyz cement plant. The Kant and the TechnoLin plants switched their sources of fuel from natural gas to coal owing to the high price of natural gas. The Kant cement plant in Chuiskaya Oblast' was the largest cement plant in Kyrgyzstan with a production capacity of 1.32 Mt/yr; the plant operated at 50% capacity in 2014 (United Cement Group, 2010a, b; Informational-Analytical Centre for Oil and Gas JSC, 2013).

In August, Gansu Shangfeng Cement announced that its subsidiary Tongling Shangfeng Cement had signed a cooperation letter of intent with Zhu Rongjun to acquire equities and invest in Zeth Cement in Kyrgyzstan. Tongling Shangfeng would hold 58% of Zeth Cement and Zhu Rongjun would hold the remaining 42%. Tongling Shangfeng and Zhu Rongjun were expected to invest in the construction of a new cement plant in Kemin, Chuiskaya Oblast', which is located 13 kilometers (km) east of Bishkek. The cost of the plant construction was estimated to be $70 million, and the construction was expected to be completed within 15 months. In 2014, the Tushtuk Kyrgyz cement plant was closed for maintenance of one of the cement production lines (Cementchina.net, 2014; Global Cement Staff, 2014; Bishkek Post, 2015; International Cementreview, 2015, p. 204).

Minerals Fuels and Related Materials

Coal.—According to the State Enterprise Kyrgyzkomir, in 2014, coal production increased by 25% to 1.78 Mt from 1.42 Mt in 2013. In addition to bituminous coal and lignite, the country had resources of coking coal. In 2012, Celsius Coal Ltd. of Australia acquired 80% interest in the Uzgen Basin coking coal project, which is located on the southwestern slope of the Fergana Range. The project covered three areas—Kargasha, Kokkia, and Min Teke—located on the northern end of the main project. As of March 2014, Celsius Coal estimated the total inferred resources at the Uzgen Basin coking coal project to be 295 Mt of coal (235 Mt at Kargasha and 60 Mt at Kokkia), and that the identified coal resources at Min Teke had been increased to 27 Mt from 5 Mt. Celsius Coal also held a 90% interest in the Alai Range Coal Project, which is located in the Naukat District, Osh region. The project consisted of the Bel Alma and Sary Mogul Mines. In 2013, Celsius Coal conducted small-scale mining at the Min Teke (7,500 t of coal) and Sary Mogul (7,300 t of coal) projects. In the third quarter of 2014, Celsius Coal decided to idle its mine operation at the Sary Mogul project owing to low demand for coal. Celsius Coal continued construction of the Trans-Asia Railway, which was expected to pass within 10 km of the Uzgen Basin coking coal project and to connect to China's existing railway network at Kashgar (Kashi) in Xinjiang Province. The railway was expected to be completed by 2016 (Celsius Coal Ltd., 2012a, p. 8; 2012b, p. 3; 2014a, p. 1, 6; 2014b, p. 1, 5; 2014c; Levina, 2014; Trend, 2014).

Natural Gas.—According to the Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA), Kyrgyzstan has limited natural gas resources that are estimated to be about 9 billion cubic meters. Some of the gasfields in Kyrgyzstan remained undeveloped owing to their geologic locations and the lack of infrastructure. In 2014, Gazprom of Russia and the Government of Uzbekistan agreed to resume supplying natural gas to southern Kyrgyzstan (Energy Charter Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA), 2011, p. 11; Times of Central Asia, The, 2014).

Kyrgyzgaz JSC was founded in 1999 in Bishkek, Kyrgyzstan, and was responsible for transporting natural gas imported from Uzbekistan and Kazakhstan. In 2013, Kyrgyzstan's Parliament approved a 25-year agreement that allowed Gazprom Russia to acquire Kyrgyzgaz. According to the agreement, Gazprom would receive a 100% share of Kyrgyzgaz JSC for $1.00. Kyrgyzgaz would retain control of pipelines, gas distribution across the country, underground storage facilities, construction, reconstruction, and use of gas pipelines. Gazprom was expected to begin gas exploration, to control the rates for distribution of gas through Kyrgyzstan to other countries, to store natural gas in underground storage facilities, to pay $40 million of debt owed by Kyrgyzgaz, and to invest $650 million in the country's infrastructure (Kyrgyzstan's pipeline network) over the next 5 years (Gazprom, 2013; Mineral.ru, 2013; Natural Gas Europe, 2013; Bloomberg Businessweek, 2014; Natural Gas Asia, 2014a).

After acquisition of Kyrgyzgaz by Gazprom, Uzbekistan stopped exporting natural gas to the southern part of Kyrgyzstan owing to the expiration of its contract with Kyrgyzstan and the lack of a contract with Gazprom to supply natural gas. In 2014, Uzbekistan resumed suppling natural gas to southern Kyrgyzstan; the reason for resuming the supply was not stated. Kyrgyzstan signed an agreement with Uzbekistan to purchase 25 million cubic meters of natural gas from Uztransgaz, and an agreement with Kazakhstan to purchase 100 million cubic meters of natural gas from KazTransGas. The estimated cost was expected to be $290 per thousand cubic meters from Uztransgas and $224 per thousand cubic meters from KazTransGas (Asia-Plus, 2014; Eurasianet.org, 2014; Natural Gas Asia, 2014b).

Uranium.—In 2014, the Kara-Balta mining complex (KGRK) was one of the leading processors of uranium raw materials for the nuclear industry. Owing to modernization, the capacity of the complex was more than 3,000 t/yr of U_3O_8. In 2014, however, the production of processed uranium (Ucontent) increased by 31% to 1,700 t compared with that of 2013 owing to the inconsistent imports of raw materials from Kazakhstan, Russia, and Tajikistan. In 2013, KGRK requested that Kazakhstan provide between 2,500 t and 3,000 t of uranium concentrates, but Kazakhstan only agreed to provide 1,500 t. According to KGRK, the company needed to start obtaining its raw materials for long-term use by gaining access to one of the deposits in Kazakhstan through a joint venture with the National Atomic Company Kazatomprom of Kazakhstan or by purchasing raw material directly from mining enterprises in Kazakhstan on long-term contracts. The other option was to begin exploration for and development of deposits in Kyrgyzstan (Denisenko, 2013; Central Asia.ru, 2014; Ibraev, 2014).

Outlook

According to the Asian Development Bank, Kyrgyzstan's GDP would increase by only 1.7% in 2015 owing to the economic contraction in Russia. Kyrgyzstan is intensifying its efforts to increase mineral production and to attract foreign investors for its mining and manufacturing industries. Kyrgyzstan awarded several licenses for exploration, development, and mining of mineral resources, such as coal and gold, and a construction agreement for construction of a cement plant. Given these efforts, Kyrgyzstan might be able to increase its cement, coal, gold, and natural gas output over the next few years and, perhaps, start production of coking coal. Factors such as the Glacier Law and closed roads could limit Centerra's gold output and Kadamdzhay's antimony production (Asian Development Bank, 2015, p. 124).

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TABLE I
KYRGYZSTAN: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Antimony:						
Mine output, Sb content		700	1,500	1,200	0.026	--
Metal and compounds		842	892	924	422 [r]	105
Gold, mine output, Au content	kilograms	18,072	18,647	10,332	19,000	18,000
Mercury, metal	do.	98,700	112,700	74,700	70,500	46,000
INDUSTRIAL MINERALS						
Cement, hydraulic		759,700	1,022,000	1,239,000	1,675,800	1,727,500
Clays, kaolin		NA	108,900	113,900	133,500	NA
Gypsum		51	57	59	37 [r]	39
Lime[e]		6,500	2,600	3,000	5,700	5,800
Salt, rock[e]		900	800	900	600	600
Sand and gravel		NA	745,900	566,500	1,160,100	1,165,000
Sands, other[e]	cubic meters	850,000	850,000	800,000	934,000	935,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		65,000	94,000	132,600	167,800	326,500
Lignite		510,000	745,000	1,051,400	1,256,800	1,450,900
Total		575,000	839,000	1,184,000	1,424,600	1,777,400
Gas, natural:	thousand cubic meters	22,800	26,600	18,500	32,500	33,800
Petroleum, crude:						
In gravimetric units		70,700	77,000	83,600	83,700	82,900
In volumetric units	42-gallon barrels	602,000	656,000	612,800	613,500	608,000
Uranium, processed:						
U_3O_8 content[e]		2,000 [r]	2,000 [r]	1,800 [r]	1,500 [r]	2,000
U content		1,700 [r]	1,700 [r]	1,500 [r]	1,300 [r]	1,700

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through July 14, 2015.

[2] In addition to the commodities listed, Kyrgyzstan was thought to have produced a number of other mineral commodities, including copper, fluorspar, mined mercury, molybdenum, silver, tin, and tungsten, but available information was not adequate to make reliable estimates of output.

Source: FOR.kg, 2014; National Statistical Committee of the Kyrgyz Republic, 2014.

TABLE 2
KYRGYZSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Antimony:				
Sb content of ore		Kadamzhay mining and metallurgical complex (OJSC Kyrgyzaltyn, 100%), which included the Kadamzhay Mine and the Terek-Sayskiy Mine, Khaydarkan mining and metallurgical complex	Batkenskaya Oblast', Khaydarkan, Batkenskaya Oblast'	2,400 [2]
Metal and compounds		Kadamzhay metallurgical facility (ATF Invest, a subsidiary of ATF Bank of Kazakhstan, 70.4%)	Kadamzhayskiy Rayon	28,000
Cement		OJSC Kant cement plant (United Cement Group)	Kant, Ysykaty district, Chu Oblast'	1,316,000
Do.		Aravan cement plant (China-Kyrgyz Co.)	Aravan Oblast', Oshkaya Oblast'	200,000
Do.		LLC TechnoLin cement plant (United Cement Group)	Kant, Ysykaty district, Chu Oblast'	359,000
Do.		South Kyrgyz Cement CJSC (Verny Capital)	Kyzyl-Kiya, Batkenkaya Oblast'	1,300,000
Do.		CJSC Kurmentycement	Ak-Bulak village, Issyk-Kulskaya Oblast'	60,000
Do.		CJSC Yuzno-Kyrgyzkiy Cement	Southwestern part of Kyrgyzstan	825,000
Do.		Tushtuk Kyrgyz cement plant (China-Kyrgyz Co.)	Kyzyl-Kiya, Batkenskaya Oblast'	750,000 [3]
Coal		Celsius Coal Ltd.	Min Teke and Sary Mogol	14,800
Do.		Seven underground mines and five open pits among the following deposits: Almalyk, Dzhergalan, and, Kok-Yangak, Kyzyl-Kiya, Sulyukta, and Tashkumyr	Southwestern, central, and northeastern parts of Kyrgyzstan	2,200,000 [2]
Do.		Kyrgyzkomur, 51%, and Bishkek CHP and local society, 49%	Kara-Kiche Mine, Narynskaya Oblast'	NA
Copper		Talas Copper Gold LLC	Talasskaya Oblast'	NA
Do.		Kuru-Tegerek (CJSC Kichi-Chaarat)	Chatkal region, Jalal-Abadskaya Oblast'	NA
Do.		OcOO Kazakhmys, Gold Kyrgyzstan LLC	Ala-Buka region, Jalal-Abadskay Oblast', Bozymchak deposit	9,800
Fluorspar, concentrate		Khaydarkan mining and metallurgical complex	Khaydarkan deposit	5,000
Gold:				
Au content of ore	kilograms	Kumtor Gold Co. (Centerra Gold Inc., 77%, and OJSC Kyrgyzaltyn, 33%)	Kumtor deposit, Jeti-Oguz District, Issyk-Kulskaya Obalst'	22
Do.	do.	OJSC Kyrgyzaltyn (Government, 100%)	Makmal deposit, Toguz-Toro region Jalal-Abadskaya Oblast'	600
Do.	do.	Newmont Mining Corp., 50%, and OJSC Kyrgyzaltyn, 50%	Narynskaya Oblast' Solton-Sary Mine	170
Do.		Talas Gold (Gold Fields, Ltd., 100%)	Jerooy-Bashi, Pereval	NA
Do.	kilograms	OJSC Kyrgyzaltyn, 40%, and Superb Pacific Ltd., 60%	Kemin region, Chuiskaya Oblast' Taldy-Bulak Levoberezhny deposit	3,628 [2]
Do.		Full Gold Mining LLC	Ala-Buka region, Jalal-Abadskay Oblast', Ishtamberdy deposit	NA
Do.		Highland Gold Mining Ltd., 100%	Jalal Abad region, Ala-Buka region Unkurtash gold deposit (Unkurtash, Sarytube, and Karatube prospects)	NA
Do.	kilograms	Bozymchak gold deposit (Kaz Mineral plc)	Ala-Buka dregion, Jalal-Abadskaya Oblast'	900 [2]
Refined		Kara-Balta refinery	Chuyskaya Oblast'	NA
Mercury:				
Hg content of ore		Khaydarkan mining and metallurgical complex	Khaydarkan and Novoye deposits	700 [2]
Metal		do.	Khaydarkan deposit	1,000
Molybdenum, for nonmetallurgical uses		Kara-Balta mining and metallurgical complex (GK Renova, 72.28%)	NA	500

See footnotes at end of table.

TABLE 2—Continued
KYRGYZSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Natural gas	million cubic meters	Kyrgyzazmunayat	Approximately 300 wells; Changyr-Tash, Chigirchik Pereval, Izbaskentskoye, Kara-Agach, Mayluu-Suu, Susahoye, and Togap-Beshkenskoye deposits	100 [2]
Petroleum		Kyrgyz Petroleum Co. (Kyrgyzneftgaz)	Jalal-Abadskaya Oblast'	5,000
Silver		NA	Karagoyskoye deposit, Oshskaya Oblast'	NA
Do.		NA	Kumyshtag deposit, Talasskaya Oblast'	NA
Tin		Novosibirsk Integrated Tin Works	Atdzhaylau deposit	150
Do.		do.	Trudovoye deposit	350
Do.		Tyanshanolovo mining and beneficiation complex	Sary-Dzhas field	NA
Do.		NA	Uchkoshkon deposit, Sary-Dzhas field	NA
Tungsten		Enil'chek JSC mining enterprise	Atdzhaylau deposit	90
Do.		do.	Trudovoye deposit	9,560
Uranium, processed		Kara-Balta mining and metallurgical complex (GK Renova, 72.28%)	Zarechnoye deposit, Chuyskaya Oblast'	3,600
Uranium		Kyzyl Ompul Mine, (Kyrgyzstan LLC UrAsia 100%)	Kyzyl Ompul Mine, Narynskaya Oblast'	NA
Do.		Linia Prava (LPU) (Nimrodel Resources, 90%)	Batken Leases, Southern Fergana Valley, Batkenskaya Oblast'	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2] Capacity estimates are the total for all enterprises that produce that commodity.

[3] Cement plant was closed in 2014 owing to technical problems.

THE MINERAL INDUSTRY OF LATVIA

By Karine M. Renaud

Latvia is located in northeastern Europe and shares a land border with Belarus, Estonia, Lithuania, and Russia, and a maritime border with Estonia, Lithuania, and Sweden. Latvia was the world's 8th-ranked peat producer in 2014. In Latvia, peat was used mainly for fuel, although some was used for agriculture. The mineral-processing industry produced steel products; the country also had a small mineral industry that was engaged primarily in the mining of industrial minerals, including =dolomite, gypsum, and sand and gravel. Latvia's Ports of Liepaja, Riga, and Ventspils Nafta are essential for the transit trade of Russian and other Commonwealth of Independent States' imports and exports. The Ventspils seaport, a major port on the Baltic Sea, consisted of 10 terminals. Of Latvia's exports moving through this port, 53% was oil and oil products; 26%, coal; 9%, other mineral products; and 6%, fertilizers. The Liepaja Port consisted of 14 terminals. JSC Liepajas Metalurgs shipped general cargo, dry bulk cargo, metals, cement, and other materials through the Liepaja Port. The company's products accounted for 36% of the total freight handled at the port, and its bulk cargo alone accounted for 26% of the total freight handled. The Port of Riga consisted of 33 terminals. Of all exports moving through the port, 41% was coal; 21% was oil and oil products; and 18% was other mineral products. The second largest terminal at Riga was STREK, which accounted for 14% of the country's coal exports (KPMG Baltics SIA, 2013, p. 12; 2014, p. 25; Apodaca, 2016; Central Statistical Bureau, 2015c, p. 5).

Minerals in the National Economy

The growth of Latvia's real gross domestic product (GDP) decreased to 2.4% in 2014 from 4.2% (revised) in 2013 owing to slower growth in the European Union and the weak economic situation in Russia. The nominal GDP was about $26.3 billion. Production in the mining and quarrying sector increased by 3.5% owing to the fast growth (6.7%) in the construction sector. In 2014, 2,087 permits were granted for the construction of new buildings, capital repairs, and reconstruction and restoration of single dwellings, of which 1,405 were permits for the construction of new buildings. Also, 439 permits were granted for construction of industrial buildings and warehouses, of which 273 were for the construction of new buildings. Output in the industrial sector decreased by 1.1% in 2014 owing to declines in manufacturing (0.1%) and electricity and gas supply (4.3%) and to the suspension of operations of JSC Liepājas Metalurgs. The manufacturing sector employed 137,600 workers in 2014 compared with 146,300 in 2013 (Ministry of Economics, 2014, p. 43; 2015, p. 10, 18; Central Statistical Bureau, 2015c, p. 39–40, 52, 54–55; 2015d).

Mineral Trade

The country's total exports increased by 1.02% to $13.1 billion (EUR10.24 billion)[1] in 2014 from $12.8 billion (EUR10.02 billion) in 2013 owing to an increase in exports of goods. Base metals and articles made of base metals accounted for 9.1% of total exports, by value. Latvia's major export partners were Lithuania, which received 18.7% of total exports, by value; Estonia, 11.8%; Russia, 10.8%; Germany, 6.9%; Poland, 6.5%; and Sweden, 5%. In 2014, Latvia exported aluminum and aluminum products; bituminous substances; copper and copper products; iron and steel and iron and steel products; lead and lead products; mineral fuels; mineral oils and products of their distillation; mineral waxes; nickel and nickel products; and zinc and zinc products (Central Statistical Bureau, 2015a; 2015c, p. 48, 50; Ministry of Economics, 2015, p. 10).

Total imports decreased by 1% to $16.1 billion (EUR12.64 billion) from $16.3 billion (EUR12.84 billion) in 2013. Mineral products accounted for 14.6% of total imports (in terms of value); crude oil and oil products, 9.4%; and chemical and related industries products, 9.5%. The country's major import partners were Lithuania, which supplied 17.6% of total imports, by value; Germany, 11.4%; Poland, 11.2%; Russia, 8.1%; and Estonia, 7.7%. In 2014, Latvia imported aluminum and aluminum products, bituminous substances, cement and lime, copper and copper products, earth and stone, iron and steel and iron and steel products, lead and lead products, mineral fuels, mineral oils and products of their distillation, mineral waxes, plaster materials, salt, and sulfur (Central Statistical Bureau, 2015a; 2015b; 2015c, p. 48, 50; Ministry of Economics, 2015, p. 19).

Latvia's exports to the United States were valued at $274.5 million in 2014 compared with $272.7 million in 2013. In 2014, coal and related fuels accounted for about $8.6 million; advanced iron and steel, $4.0 million; steelmaking materials, $770,000; iron and steel products, $294,000; bauxite and aluminum, $65,000; gemstones and diamond, $26,000; and cement sand and stone, $5,000. In 2014, imports from the United States were valued at $428.2 million compared with about $494.6 million in 2013, including $2.8 million in petroleum products, $818,000 in nonferrous metals, $311,000 in copper, $268,000 in iron and steel products, $244,000 in iron and steel mill products, $82,000 in nonmetallic minerals, $68,000 in aluminum and alumina, $33,000 in gemstones and diamond, and $13,000 in metallurgical-grade coal (U.S. Census Bureau, 2014a, b).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783=US$1.00 for 2013.

Production

In 2014, cement production increased by 20% compared with that of 2013. Peat production decreased by 53%, and crude dolomite (excluding calcined, crushed dolomite aggregate) decreased by an estimated 6%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Liepājas Metalurgs, which was leading metallurgical company operating in Latvia, had its own port facility at the Liepaja Port; the company produced steel products for domestic use and export. CEMEX SIA, which was wholly owned by CEMEX S.A.B. de C.V. of Mexico, was the only cement producer and supplier of ready-mix cement in the country. Table 2 is a list of major mineral facilities.

Commodity Review

In April 2014, a nonbinding letter of intent was signed between Ginguro Exploration Inc. of Canada, which was a mineral exploration company, and the Government for the potential exploration of the Kurzeme Complex. The Kurzeme Complex is the largest layered mafic intrusion of the Fennoscandian Shield, which hosts copper, nickel, and platinum-group metals. The area of the Kurzeme Complex is 9,300 square kilometers (km^2) (Marketwired L.P., 2014).

Metals

Iron and Steel.—In 2014, Liepājas Metalurgs remained the only metallurgical company in Latvia and the Baltic States that produced rolled steel bars. In the spring of 2013, Liepājas Metalurgs suspended production, and production remained suspended in 2014 owing to a lack of funding, which led to the company filing for bankruptcy. Liepājas Metalurgs's semi-integrated metallurgical mill plant had an electric arc furnace with a designed production capacity of 850,000 metric tons per year (t/yr) of steel products. In October 2014, the KVV Group of Ukraine signed a contract to purchase Liepājas Metalurgs; the cost was estimated to be $138 million, which would be paid over 10 years. The plant was expected to be recommissioned with a production capacity of 35,000 metric tons per year (t/yr) and would employ 450 to 500 workers (BNS and Nozare.lv, 2014; JSC Liepājas Metalurgs, 2014a, b; LETA, 2014; Thomson Reuters, 2014).

Industrial Minerals

Cement.—As of December 2014, CEMEX SIA operated the Broceni cement plant, which produced mainly ready-mix concrete for the country's industrial and construction sectors. CEMEX also operated six ready-mix concrete plants, a new mobile pugmill, and one aggregates quarry. In 2013, CEMEX completed the installation of a new kiln at the Broceni cement plant, which was initiated in 2006; the cost of the project was estimated to be $409 million. The production capacity was increased by 800,000 t/yr to 1.6 million metric tons per year (Mt/yr) of cement. In 2014, the Broceni plant operated at 74% of capacity (1.2 Mt/yr). The company exported its products primarily to Belarus, Estonia, Finland, Lithuania, Russia, and Sweden (CEMEX S.A.B. de C.V., 2014a; 2014b, p. 53, 70, 85; 2014c).

Magnesium Compounds.—Dolomite was produced by DSG Karjeri Ltd., Jēkabpils Dolomīts Ltd., Salenieku Dolomīts Ltd., and Saulkalne S Ltd. in 2014. DSG Karjeri Ltd.was a leading producer of mixed, crushed, washed, and sized dolomite in Latvia. The company operated at four dolomite deposits—Ape, Birži, Levaca, and Saikava. In 2014, DSG was expected to develop a new deposit located in Ropazi Parish in the District of Riga. As of yearend 2014, no updated information was available on development of the deposit (DSG Karjeri, 2009).

Mineral Fuels and Related Materials

Peat.—Peatlands in Latvia cover about 6,400 km^2; the major deposits are located in the eastern plains and near Riga. In 2014, peat production decreased by 47% to 800,000 metric tons (t) from 1.7 Mt in 2013 owing to a rainy summer season and a Russian embargo related to transportation issues. In 2014, 44 t of peat from Latvia was halted at the Latvia-Russia border. The peat was supposed to be transported from Latvia to Kazakhstan through Russia (table 1; Db.lv, 2014; Fisher, 2014; International Peatland Society, 2014).

In 2014, Compaqpeat SIA was the largest company involved in the extraction and processing of peat in Latvia; it employed 130 workers. Ninety-seven percent of the company's total production was exported to Asia, the Middle East, and European Union member countries. In 2012, Compaqpeat signed a contract with the Latvian Investment and Development Agency to establish a peat-processing plant in Balvi. In 2014, Compaqpeat commissioned a new, fully automated peat-processing plant with two production lines and a production capacity of 600,000 cubic meters per year (Compaqpeat SIA, 2014; Gabranovs, 2014).

Outlook

With the expansion of peat production, Latvia is likely to maintain its position as one of the world's leading peat-producing countries. The recommissioning of the Liepājas Metalurgs steel plant could increase manufacturing output. Continuing growth in the construction sector could lead to an increase in industrial mineral mining and cement production. The future of Latvia's economy and the minerals sector highly depends on political relations with Russia. It also depends on the country's ability to develop and maintain a reliable worldwide business network.

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TABLE 1
LATVIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]	2010	2011	2012	2013	2014[e]
METALS					
Steel, rolled bars	825,000 [r]	100,000 [r]	315,000 [r]	712,000 [r]	--
INDUSTRIAL MINERALS					
Cement, portland thousand metric tons	635 [r]	752 [r]	901 [r]	1,000 [r]	1,200
Dolomite, crude (excluding calcined, crushed dolomite aggregate)[e]	930,000	930,000	930,000	1,062,964 [r, 3]	1,000,000
Gravel, pebbles, shingle and flint of a kind used for concrete aggregates, for road metaling, or for railway and other ballast	4,736,785	5,641,510	6,040,668	5,274,024 [r]	5,300,000
Sand and gravel	1,388,188	2,337,916	2,425,667	2,270,275 [r]	2,300,000
Stone, crushed	1,375,197	2,050,976	2,072,775	2,664,580 [r]	2,700,000
MINERAL FUELS AND RELATED MATERIALS					
Peat	1,119,417	1,387,689	1,160,292	1,716,411 [r]	800,000 [3]

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1] Table includes data available through July 27, 2015.

[2] In addition to the commodities listed, clay, gypsum, lime, limestone, industrial sand, and silica are produced, but output was not reported, and available information was inadequate to make reliable estimates of output.

[3] Reported figure.

TABLE 2
LATVIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facility	Annual capacity
Cement	CEMEX SIA (CEMEX S.A.B. de C.V., 100%)	Plant at Broceni	1,600
Dolomite	DSG Karjeri Ltd.	Ape, Birzi, Levaca, and Saikava at Riga	NA
Do.	Jēkabpils Dolomīts Ltd.	Birzi, Salas novadas	NA
Do.	Saulkalne S Ltd.	Kranciems, Tinuzi, Ikske District	NA
Do.	Salenieku Dolomits Ltd.	Ritupes, Malnavas District	NA
Gravel, pebbles, shingle and flint of a kind used for concrete aggregates, for road metaling, railway, and other ballast	do.	Kalngals, Ciblas District, and Cirma, Cirmas District	NA
Do.	Jēkabpils Dolomīts Ltd.	Leimani, Zasa, and Osukalni-Cekules, Kraslava	NA
Peat	Klasmann-Deilmann GmbH	SIA LV-Zilaiskalns	NA
Do. thousand cubic meters	Compaqpeat SIA	Processing plant in Balvi	600
Sand	Saulkalne S Ltd.	Grinvaldi, Malpils District	NA
Do.	Jēkabpils Dolomīts Ltd.	Saulejas, between Rezekne and Daugavplis; Peleci, Preili and Viski; Draudavas, Koknese and Madona	NA
Steel	JSC Liepājas Metalurgs (KVV Group, 100%)	Plant at Liepaja	850

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF LITHUANIA

By Lin Shi

In 2014, the nominal gross domestic product (GDP) of Lithuania was valued at about $48.2 billion. The country's real GDP increased by 2.9% in 2014 compared with that of 2013. The share of mining and quarrying in the GDP was about 21% in 2014. The gross value added from mining and quarrying production increased by 1.1% compared with that of 2013, whereas the gross value added from industrial production increased by 2.3%. The country's inflation rate was about 0.3% compared with 1% (revised) in 2013, and the unemployment rate was 11.1% compared with 11.8% (revised) in 2013. The country's mining sector employed about 4,000 people compared with about 3,700 (revised) people in 2013. Lithuania was a member of the European Union (EU), the North Atlantic Treaty Organization (NATO), and the World Trade Organization (WTO). The country was a significant trading partner with Central and Eastern European countries, especially Russia. In January 2014, Lithuania assumed a nonpermanent seat on the United Nations Security Council for the 2014–15 term. The Government expected to meet the criteria set forth in the Treaty of Maastricht to join the euro area by 2015 (Statistics Lithuania, 2015; U.S. Central Intelligence Agency, 2015).

Production

In 2014, Lithuania produced approximately 7.5 million metric tons (Mt) of refined petroleum products, approximately 7.2 Mt of sand and gravel, approximately 1.4 Mt of limestone, approximately 0.9 Mt of cement, approximately 0.8 Mt of ammonia, and approximately 0.5 Mt of peat. Data on mineral production are in table 1.

Structure of the Mineral Industry

AB Akmenes Cementas was the only cement producer in Lithuania. The company was privatized in 1997, and since then had been majority owned by domestic investors. Akmenes had the capacity to produce about 1.5 million metric tons per year (Mt/yr) of cement at its Naujoji Akmene plant. Orlen Lietuva, which was a subsidiary of PKN Orlen S.A. Group of Poland, owned and operated the Mazeikiai oil refinery and oil processing plant in Lithuania. The Mazeikiai refinery had a design capacity of 15 Mt/yr of crude oil and was the only refinery in the Baltic States. It was located near the town of Mazeikiai, which is about 90 kilometers west of the petroleum terminals at Butinge, Klaipeda, and Ventspils. Mazeikiai's crude oil was supplied by the Butinge oil terminal, and most of its production was exported to other European countries (Matuliauskas, 2014; AB Akmenes Cementas, 2015a; Mazeikiai District Municipality, 2015).

Mineral Trade

In 2014, Lithuania's total exports, including mineral fuels, were valued at about $32 billion, and total imports, including metals, crude oil, and natural gas, were valued at about $35 billion. The country's major export destinations were Russia, which accounted for about 20% of the total value of exports; Latvia, about 10%; Estonia and Poland, about 8% each; Germany, about 7%; and Belarus and the United Kingdom, about 5% each. The country's imports came mainly from Russia, which accounted for about 29% of the total value of imports; Germany and Poland, about 10% each; Latvia, about 6%; and the Netherlands, about 5%. In 2014, Lithuania's total exports to the United States were valued at about $1.09 billion compared with $1.55 billion in 2013 and included petroleum products valued at about $0.7 billion; fuel oil, about $37 million; coal and related fuels, about $2 million; iron and steel products, about $208,000; and aluminum and bauxite, about $80,000. Lithuania's total imports from the United States were valued at about $681 million compared with $854 million (revised) in 2013 and included fuel oil valued at about $26 million; aluminum or alumina, about $454,000; petroleum products, about $293,000; nonferrous metals, about $292,000; nonmetallic minerals, $197,000; iron and steel mill products, about $138,000; nonmonetary gold, about $14,000; and copper, about $13,000 (U.S. Census Bureau, 2015a, b; U.S. Central Intelligence Agency, 2015).

Commodity Review

Industrial Minerals

Cement.—In 2014, Akmenes Cementas produced about 0.9 Mt of cement compared with about 1.07 Mt in 2013, and exported about 0.4 Mt of cement compared with about 0.6 Mt in 2013. Akmenes Cementas' cement production for domestic consumption was about 0.54 Mt compared with about 0.47 Mt in 2013. Akmenes Cementas also sold cement dust, which was used to produce silicate bricks and mineral wool. In 2014, Akmenes Cementas replaced the wet-process production line with a new dry-process clinker (or cement) production line. Because the dry cement production process has a much lower energy requirement than the wet cement production process, the new cement production line would enable Akmenes Cementas to reduce its fuel consumption and its carbon-dioxide emissions during the cement-manufacturing process. This new production line was the biggest production modernization project in the company's history. Akmenes Cementas' cement-testing laboratory was able to conduct chemical, mechanical, and physical testing on the cement production process and provide services regarding the measurement of parameters, such as the calorific capacities of elemental carbon and solid fuels

(AB Akmenes Cementas, 2013; 2015a, b; Matuliauskas, 2014; Mazeikiai District Municipality, 2015).

Nitrogen.—AB Achema was a leading producer of nitrogen fertilizers and chemical products in Lithuania. The company employed more than 1,400 people and had the capacity to produce about 2.7 Mt/yr of fertilizer. In 2014, Lithuania produced about 0.8 Mt of ammonia (AB Achema, 2015).

Mineral Fuels

Petroleum.—AB Orlen Lietuva's products included bitumen, diesel fuels, fuel oil, jet fuel, liquefied petroleum gas, and unleaded gasolines. As the demand for conventional oil products significantly decreased during the past few years, Orlen Lietuva was under pressure by the market to lower its oil production margins and decrease its oil product exports. In 2014, the company was affected by the rapidly declining prices of crude and refined products in the last quarter of the year, which negatively affected the value of the company's inventories. Orlen Lietuva planned to improve its operational efficiency by directing its petroleum exports to focus mainly on the Ukrainian market (Matuliauskas, 2014; AB Orlen Lietuva, 2015a, p. 39–40, p. 58; 2015b; 2015c).

Outlook

Production of cement and refined petroleum products and exports are expected to increase in 2015 as the country's dominant producers strive to invest in modernization projects. Akmenes Cementas is expected to increase its use of alternative fuels in its cement production process and to increase waste burning to reduce the amount of fossil fuels used in its production process by 50% in 2015 (AB Akmenes Cementas, 2015a).

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TABLE 1
LITHUANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons)

Commodity	2010	2011	2012	2013	2014
INDUSTRIAL MINERALS					
Cement	834,000	996,300	1,014,977	1,069,593	902,733
Clays	250,000	282,400	300,075	318,733	294,386
Dolomite, crushed	2,293,400	3,312,300	2,284,900	2,687,400	2,633,800
Granite, crushed	307,100 [r]	374,100 [r]	295,800 [r]	457,500 [r]	487,400
Limestone	928,000	1,179,000	1,354,004	1,465,455	1,368,423
Nitrogen, N content of ammonia	434,100	869,500	918,406	693,195	815,394
Peat:					
Agricultural use	326,800	384,700	325,902	432,602	417,638
Fuel use	15,000 [e]	15,000 [e]	60,254	84,060	100,640
Sand and gravel:					
Construction sand	3,104,000	3,405,000 [r]	2,893,087	4,211,405	4,083,783
Gravel, pebbles, shingle, and flint	2,551,000	2,372,000	2,188,079	2,719,511	3,080,300
Silica sand, industrial	67,300	53,400	53,909	57,007	53,924
Sulfur	73,500	76,700	73,040	81,449	76,595
MINERAL FUELS AND RELATED MATERIALS					
Petroleum:					
Crude	114,500	113,900	101,644	86,054	80,862
Refinery products	8,579,400	8,796,600	8,458,568	8,961,551	7,463,152

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised.

[1] Table includes data available through July 23, 2015.

TABLE 2
LITHUANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facility	Annual capacity
Cement	AB Akmenes Cementas (CEMEX S.A.B. de C.V., 33.95%)	Plant in Naujoji Akmene	1,500
Nitrogen, N content of ammonia	AB Achema	Jonava	2,700
Petroleum, refined	AB Orlen Lietuva (PKN Orlen S.A. Group)	Plant in Mazeikiai	15,000

THE MINERAL INDUSTRY OF MACEDONIA

By Karine M. Renaud

Macedonia is a small, landlocked, and primarily mountainous country that borders Albania, Bulgaria, Greece, Kosovo, and Serbia. Macedonia is endowed with a variety of mineral resources, such as metals (antimony, arsenic, chromium, copper ore, gold, iron ore, lead, manganese, nickel, silver, and zinc); industrial minerals (clays, including bentonite and kaolin, feldspar and mica as byproducts, gypsum, limestone, marble, sand and gravel, silica sand, talc, titanium, and volcanic materials); and mineral fuels and related materials (lignite, rare earths, and uranium). In 2014, Macedonia produced a number of metals, including aluminum, copper, ferroalloys, lead, nickel, steel, and zinc. Industrial minerals that were produced included bentonite, dolomite, feldspar, gypsum, lignite, limestone, marl, sand and gravel, silica sand, and talc (Davies, 2010; Spasovski and others, 2011, p. 486; National Geographic, 2015).

Minerals in the National Economy

According to the National Bank of the Republic of Macedonia, the real gross domestic product (GDP) increased by 3.8% in 2014 compared with an increase of 2.7% in 2013. The increase was attributed to the opening of new export facilities, investments in infrastructure, and an improvement in the labor market. The country's nominal GDP was $8.0 billion (MKD407 billion)[1] in 2014. Together, mining and quarrying; manufacturing; electricity, gas, steam, and air conditioning supply; water supply; and sewerage and waste management and remediation activities accounted for 15.6% of the total GDP in 2014 compared with 15.7% in 2013, and construction accounted for 6.4% compared with 7.1% in 2013. Industrial production, in terms of output, increased by 12% in 2014 compared with an increase of 7% in 2013.Within the industrial sector, manufacturing production, in terms of output, increased by 20.1% in 2014 compared with an increase of 10.2% in 2013. Mining and quarrying production increased by 6% in 2014 compared with an increase of 8.0% in 2013. Within the mining and quarrying sector, coal and lignite mine output decreased by 1.7% in 2014 compared with an increase of 0.8% in 2013, and that of metal ores increased by 6% in 2014 compared with an increase of 12.3% in 2013; other mine production increased by 17.8% in 2014 compared with an increase of 8.7% in 2013 (National Bank of the Republic of Macedonia, 2014a, p. 19; International Monetary Fund, 2015, p. 1; State Statistical Office Republic of Macedonia, 2015a; 2015c; 2015e, p. 504; U.S. Department of State, 2015, p. 23).

In 2014, the number of companies involved in mining and quarrying was 180 compared with 164 in 2013. Of that number, 16 were involved in metal mining; 11, mining support activities; 6, coal mining; 3, crude petroleum and natural gas extraction; and the other 144, other mining and quarrying activities. Total employment in the mining industry was estimated to be 4,164 in 2014 compared with 4,146 in 2013; of this total, 2,443 were employed in the mining of metal ores; 164, in mining support activities; 68, in coal and lignite mining; and 1,489, in other mining and quarrying activities. Total employment in the manufacturing industry was estimated to be 111,559 in 2014 compared with 104,214 in 2013; of the total in 2014, 5,848 were employed in the manufacture of basic metals, 3,130, in the manufacture of industrial mineral products; and 496, in the manufacture of coke and refined petroleum (State Statistical Office of Republic of Macedonia, 2015b, p. 9; 2015f, p. 286).

Government Policies and Programs

In 2010, an Agreement of the Energy Charter, the Energy Community Agreement, the United Nations Framework Convention on Climate Change, and the Kyoto Protocol were signed and ratified by the Government. The strategy for energy development in Macedonia was scheduled to continue until 2030, with the following objectives: (1) maintenance, revitalization, and modernization of existing infrastructure, and the construction and use of new modern infrastructure for energy production; (2) improvement of production, transmission, and use of energy, (3) increased use of natural gas; (4) and integration of the energy sector of Macedonia in the regional and European markets (Ministry of Economy, 2010, p. 1–2).

In 2014, the Commission for Preparation, Organization, and Implementation of Procedure for Granting Concessions for Exploitation of Mineral Resources, in accordance with Article 28, paragraph 1, of the Law on Concessions and PPP [Private Public Partnership], and Article 10, paragraph 2, of the Law on Mineral Resources, announced that it had started granting licenses for detailed geologic exploration and exploitation of mineral resources identified in the Decision for Start of Procedure for Granting Concessions for Detailed Exploration of Mineral Resources (No. 41–9557/1, dated October 22, 2013). The licenses were for the following locations and minerals: (1) Ciflijska Krasta in the municipality of Debrca for limestone, (2) Venule-1 in the municipality of Gradsko for limestone, (3) Kuckovo in the municipality of Gjorce Petrov for limestone, (4) Bel Kamen in the municipality of Krusevo for quartz, and (5) Dukation in the municipality of Vasilevo for clay (Ministry of Economy, 2014).

Production

In 2014, production of refinery products decreased by 99%; silica sands, by 43%; granite, by 36%; bentonite, by 29%; limestone flux, by 23%; talc (crude), by 22%; copper concentrate (gross weight), by 17%; copper concentrate (Cu content) and marl, by 16% each; copper metal (refined, electrowon), by 11%; cement and ferronickel, by 10% each;

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[1] Where necessary, values have been converted from Macedonian denar (MKD) to U.S. dollars (US$) at an average rate of MKD50.17=US$1.00 for 2014 and MKD44.31=US$1.00 for 2013.

copper mine and concentrate (ore, gross weight) output, by 6%; and nickel, Ni content of FeNi, by 5%. The production of marble and travertine increased by 280%; quartzite, by 105%; steel semimanufactures (slabs), by 89%; crude steel, by 35%; and sand and gravel (construction) by 22% (table 1; State Statistical Office Republic of Macedonia, 2015d).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

The total value of trade in 2014 was $12.2 billion compared with $10.9 billion in 2013; exports totaled $4.9 billion in 2014 compared with $4.3 billion in 2013, and imports totaled $7.3 billion in 2014 compared with $6.6 billion in 2013. In 2014, exports of iron and steel decreased by 10% to $723.2 million from $805.2 million in 2013; that of petroleum and petroleum products decreased by 23% to $73.2 million from $94.7 million; manufactured metals increased by 20% to $69.9 million from $58.4 million; manufactured industrial mineral products increased by 2% to $49.1 million from $49.9 million; and nonferrous metals decreased by 38% to $13.6 million from $22.0 million. The country's main export partners were Germany (41%), Bulgaria and Italy (6% each), Serbia and Greece (5% each), and Belgium (3%) (National Bank of the Republic of Macedonia, 2014b–d).

In 2014, imports of nonferrous metals increased by 67% to $911 million from $593 million; manufactured industrial mineral products, by 109% to $247.6 million from $118.6 million; manufactured metals, by 11% to $152.9 million from $137.8 million; and natural gas, by 3.9% to $114.5 million from $110.2 million. Imports of petroleum and petroleum products decreased by about 5% to $707 million from $745.7 million in 2013; iron and steel, by 1% to $361.8 million from $364.7 million; and coal, coke, and briquets, by 15% to $39.6 million from $46.7 million. The country's main import partners were the United Kingdom (12%), Germany (11%), Greece (9%), Serbia (8%), Italy and China (6% each), Bulgaria and Turkey (5% each), and Romania (3%) (National Bank of Republic of Macedonia, 2014b–d).

Macedonia's exports to the United States were valued at $167 million in 2014 compared with $62 million in 2013. Of this amount, iron and steel mill products accounted for about $21.3 million; steelmaking material, $141,000; iron and steel (advanced), $100,000; and stone, sand, and cement, $99,000. In 2014, imports from the United States were valued at $33.9 million compared with about $54.8 million in 2013; imports included $11,000 in iron and steel products (other) (U.S. Census Bureau, 2014a, b).

Commodity Review

Metals

Copper and Gold.—In 2014, the Buchim copper mine was the only operating copper mine in Macedonia; the mine was operated by Solway Investment Group Ltd. of Cyprus. Solway planned to renew the exploration license for copper at the Kadiica Mine near Pehcevo. The Kadiica Mine was expected to be mined by open pit and underground methods, and the company was expected to use a closed water collection and treatment system. The mine was expected to start operating in 2015 with annual production of 4,500 metric tons (t) of copper (Independent.mk, 2014a; Macedonia Information Centre, 2014a, p. 7; SeeNews, 2015).

In 2014, most of the copper and gold deposits in Macedonia were in the exploration stage. In 2014, Euromax Resources DOOSkopje (formerly known as Phelps Dodge Vardar DOOEL Skopje), which was a joint venture between Euromax Resources (Macedonia) Ltd. of Canada (99.9%) and Euromax Resources (Macedonia) UK Ltd. of the United Kingdom (0.1%), held the licenses for the Ilovica (also known as Ilovitza) porphyry copper-gold system, which is located within the Ilovica property in southeastern Macedonia, 15 kilometers (km) west of the border with Bulgaria. Ilovica is part of a northwest-southeast-trending Tertiary magmatic arc that extends from central Romania through Serbia, Macedonia, southern Bulgaria, and northern Greece, to eastern Turkey. As of November 2013, the resources (measured and indicated) of the Ilovica deposits were estimated to be 237.1 million metric tons (Mt) of sulfides at grades of 0.33 gram per metric ton (g/t) gold and 0.22% copper; the content was estimated to be 79,030 kilograms (kg) (about 2.54 million troy ounces) of gold and 510 t (about 1.12 million pounds) of copper. The total probable reserves were estimated to be 225 Mt of ore (diluted and recovered) at grades of 0.34 g/t gold and 0.2% copper. The total probable oxide reserves were estimated to be 16 Mt at a grade of 0.33 g/t gold. In 2014, Euromax Resources signed an agreement with the European Bank for Reconstruction and Development (EBRD) to sell 20% of the shares of the project for development of the Ilovica porphyry copper-gold mine minus a share from the issued but not distributed shareholding capital of the company. According to the agreement, the EBRD was expected to purchase the shares for $5 million, which would be used to prepare a feasibility study and the engineering and design work for development of the mine. Royal Gold Co. of the United States was also interested in mining of copper and gold at Ilovica, and the company was expected to invest $175 million. The mine was expected to be mined by open pit methods, with annual production of 2,955 kg of gold and 16,000 t of copper; the mine life was expected to be 23 years (Euromax Resources Ltd., 2013; 2014a; 2014b, p. 1, 4, 11–12; Macedonian Information Centre, 2014b, p. 6; Melohina, 2014).

In 2013, Reservoir Minerals Inc. of Canada was granted an exploration license for the Konjsko gold project in Kozuf Massif in southern Macedonia. In 2014, Reservoir Minerals conducted a survey at the Konjsko gold project, which included prospecting and systematic rock and soil sampling, and trenching. Rock and soil geochemistry and geologic mapping helped to identify a 2.5-km-long gold anomaly. The channel sampling along 19 meters (m) of outcrop profile (from 72 to 91 m) yielded an average grade of 2.0 g/t gold (ranging from 0.075 to 9.85 g/t gold). The company also was granted a 1.36-square-kilometer (km^2) area with gold mineralization, which was an extension of the Konjsko gold project, as well as an exploration license to the 24.53-km^2 Dvoriste mineral exploration concession, which was prospective for porphyry-gold mineralization. The Dvoriste license area is located 25 km northeast of Euromax Resources's Ilovica porphyry copper-gold project. Exploration of the Dvoriste license area was expected to start in spring 2015 and to continue in the Konjsko license area in 2015 (Reservoir Minerals Inc., 2014, p. 3, 19–20).

In 2014, the Konstantinovsky Plant of Metallurgical Equipment OOO of Ukraine invested $200 million in a plant for copper processing and manufacturing of cathodes, copper pipes, and copper wires. The plant was expected to begin operating in late 2015 or early 2016, and to create from 400 to 500 jobs. The company's initial step was to conduct geologic exploration of sites at Vladovo and Staro Nagoricane. In 2008, Euromax Resources conducted an exploration survey of one of the copper sites at Vladovo, the Kazan Dol copper mine. The results showed a shallow-dipping copper-oxide zone with average thickness ranging from 25 to 100 m, and exceeding 200 m in places; the mineralization extends over an area of 800 m by 400 m. The drilling results showed 47 m grading 0.59% copper, and trenching results showed 210 m grading 0.4% copper and 175 m grading between 0.44% copper and 0.39% copper. The Konstantinovsky plant was expected to start developing the Kazan Dol copper mine by 2015 (Independent.mk, 2014b; Ligovski and others, 2014, p. 1; Macedonia Information Centre, 2014a, p. 7; Macedonian International News Agency, 2014).

Iron and Steel.—In 2014, semimanufactured steel was produced by a leading steel producer, Makstil A.D. Skopje. Duferco Group held a 62.4% stake in Makstil through Duferco Skopje Investment Ltd.; Minyork Overseas Ltd. held a 19.4% stake, and other shareholders held the remaining 18.2%. The country's production of secondary crude steel increased by 35% to 196,452 t from 145,633 t, and slab production increased by 89% to 187,991 t from 99,689 t as a result of an increase in demand. Makstil operated two units, including a hot-rolling mill and the steelworks of Zelezara Skopje. It employed 791 people (Dimitrievska, 2014; Duferco, 2014, p 34; Makstil, 2014).

Lead and Zinc.—Lead and zinc were produced from the Sasa Mine, which was operated by the Solway Investment Group Ltd. of Russia, and the Zletovo and Toranica Mines, which were operated by the Indo Minerals and Metals DOOEL. The Zletovo Mine is located in the eastern part of the Kratovo-Zletovo volcanic complex. The deposit is classified as subvolcanic hydrothermal lead-zinc; the mineral assemblage is composed of chalcopyrite, galena, pyrite, siderite, sphalerite, and the sulfosalts series. The reserves at the Zletovo Mine were estimated to be 16 Mt grading 6% lead and 2% zinc. The Toranica lead-zinc deposit is located in eastern Macedonia in the Sasa-Toranica mining district of the Osogovo Mountains. The Toranica orefield covers 30 km^2 with mineralization vertically extended between 1,300 and 1,800 m. In 1981, the ore reserves were estimated to be 12.6 Mt grading 4.4% lead and 2.9% zinc. The economic mineralization is related to quartz-graphite schist, and the mineral assemblage is composed of chalcopyrite, galena, pyrite, and sphalerite (Serafimovski and others, 2006a, p. 445–446; 2006b, p. 535–536; Indo Minerals and Metals, DOOEL, 2014).

In 2014, Solway Investment Group invested EUR18 million[2] ($22 million) in the Sasa Mine to prepare the mine with facilities and equipment to develop the new site. Solway Investment Group was waiting for the Government to issue new concessions for the Sasa Mine, which was expected to create 50 jobs (SeeNews, 2015).

Industrial Minerals

Cement.—In 2014, the Titan Cementarnica USJE AD (USJE) was the only cement producer in Macedonia; it was operated by Titan Group of Greece. USJE produced cement, clinker, and other related products. Cement production decreased in 2014 to 687,000 t from 762,000 t in 2013 owing to a decrease in consumption. In 2014, USJE cement was used for the construction of the Demir Kapija-Smokvitsa highway. In 2014, 30% of the capacity of oven 3 was used, 71% of the capacity of oven 4 was used, and 35% of the capacity of the cement mills was used (the total capacity of the plant was not specified) (Cementarnica USJE AD, 2014, p. 3).

Stone, Dimension.—In 2013, Fox Marble Holdings plc of United Kingdom signed a 20-year agreement through its local subsidiary (the name was not specified) to operate a marble quarry in the municipality of Prilep. The quarry contains high-quality white Sivec® marble. In 2014, Fox Marble entered into a sublease agreement with New World Holdings (Malta) Ltd. of Malta to acquire the rights to a second Sivec marble quarry (Prilep Omega Sivec Quarry), which was located near the existing Sivec quarry (Fox Marble Holdings plc, 2014a, p. 6–7, 43; 2014b).

Minerals Fuels and Related Materials

Macedonia produced coal and petroleum products, but not natural gas and crude petroleum, and the country had been highly dependent on energy imports since 2000. In 2014, the main sources of energy, by total consumption of primary energy, were coal, crude oil, petroleum products, and natural gas. Macedonia produced only low-calorie lignite coal, and the all other types of minerals fuels, including oil, natural gas, and other types of coal, were imported (Dameski, 2012; Ministry of Economy, 2010, p. 5, 19, 35).

Coal.—In 2014, lignite was a major resource for electricity production The country's total coal reserves were estimated to be 664 Mt of coal. In 2014, coal was produced by AD ELEM in Brod-Gneotino Mariovo, Oslomej, Popovjani, Suvodol, and Zivojno, and the BRIK Berovo and Drimkol Mines were operated by concessionaries that were privately owned companies. In Macedonia, there were two categories of coal mines: (1) those that produced lignite from the Brod-Gneotino, Mariovo, Oslomej, Popovjani, Suvodol, and Zivojno Mines for use by state-owned thermal powerplants within AD Elem, and (2) those that produced lignite from BRIK Berovo and Drimkol for wide consumption (Dameski, 2012; AD ELEM, 2015).

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[2] Where necessary, values have been converted from euros area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.82=US$1.00 for 2014 and EUR0.73=US$1.00 for 2013.

The Suvodol coal mine, which covers 3 km^2, has a coal seam with an average thickness of 14.97 m. As of June 2008, the estimated coal reserves at the Sudovol Mine were 36 Mt. The annual production of coal at the mine ranged between 6 and 7 Mt. The coal produced at the Suvodol and the Brod-Gneotino coal mines was used by the thermal powerplant at Bitola. The Zivojno deposit, which is located in the Pelagonia region approximately 35 km southeast of the town of Bitola, had reserves that were estimated to be 105.8 Mt of coal with 14.8% ash. The annual production capacity at the Zivojno coal mine ranged between 2.5 and 3.0 Mt of coal. The production of coal from the Mariovo, the Negotino, the Popvjani, and the Zivojno coal mines would also be used by the thermal powerplant at Bitola. The thickness of the coal seams at these mines was between 0.4 and 8 m, and the depth varied from 33 to 195 m based on the relief on the surface. The reserves of the Mariovo coal mine cover an area of 14 km^2; the total coal reserves were estimated to be 96.7 Mt with 23.2% ash. The production capacity of the Mariovo coal mine was about 2.0 Mt of coal. The coal produced from the Oslomej coal mine would be used to meet coal demand at the Oslomej thermal powerplant. The Oslomej coal mine's annual production ranged from 530,000 t to 1.07 Mt of coal; the estimated coal reserves were 11 Mt of coal. The production capacity of the BRIK Berovo Mine ranged from 35,000 to 70,000 t/yr, and that of the Drimkol Mine ranged from 40,000 to 70,000 t/yr of coal (Ministry of Economy, 2010, p. 35; 2014, p. 10; AD ELEM, 2012a, p. 2; 2012b, p. 2, 4; 2012c, p. 4; Dameski, 2012; ÅF Mercados Energy Markets International, 2013, p. 32).

Natural Gas and Petroleum.—In 2014, Lukoil Macedonia Ltd., Makpetrol AD, and OKTA Crude Oil Refinery A.D. Skopje (OKTA) supplied fuel in Macedonia. OKTA was the leading fuel supplier in Macedonia. As of 2014, the shareholders of the company were EL.P.ET. Balkani S.A., which was a subsidiary of HELLENIC Petroleum S.A. (81.51%), Pucko Petrol (10.87%), and OKTA employees (7.62%). OKTA obtained its fuel supply through the Thessaloniki refinery in northern Greece; a pipeline was used to transport petroleum products to Macedonia. In 2014, OKTA focused on oil trading; the supply of crude oil and petroleum products was affected by fluctuations in prices (HELLENIC Petroleum S.A., 2014, p. 7–8; 2015).

Macedonia imported natural gas from Russia through the only natural gas pipeline (South Stream) that passed through Ukraine, Romania, and Bulgaria, which had a carrying capacity of 800 million cubic meters per year. In December 2014, the Government of Russia announced the possibility of constructing a new natural gas pipeline that was expected to replace South Stream, and it was expected to pass through Macedonia and Serbia, which might ensure energy stability in the region (Ministry of Economy, 2010, p. 4, 41; Independent.mk, 2014c).

Outlook

The Government of Macedonia is actively trying to attract foreign investment for the development of infrastructure projects and the mineral industry. In 2014, foreign companies were enagaged in the development of copper, gold, lead, and zinc deposits. In addition, the Government of Macedonia is actively working to improve the country's energy sector. Given these efforts, it is likely that Macedonia will be able to increase its output of copper and gold and continue to expand production of coal, oil, and natural gas. Development of oil and gas reserves could help the country prevent long-term environmental problems associated with the use of coal.

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TABLE 1
MACEDONIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, secondary		309	423	426	101	--
Copper, mine and concentrate output:						
Ore, gross weight	thousand metric tons	4,199	4,118	4,435	4,646	4,367
Concentrate:						
Gross weight		37,678	35,976	45,266	46,677	38,987
Cu content[e]		7,500 [r]	7,200 [r]	9,100 [r]	9,300 [r]	7,800
Metal, refined, electrowon		--	--	1,000 [r]	1,890 [r]	1,690
Iron and steel:						
Ferroalloys:						
Ferronickel		62,665 [r]	75,174 [r]	83,478 [r]	86,961 [r]	78,496
Ferrosilicon		30,044	56,167	42,402	72,279	73,014
Silicomanganese		36,705	50,756	14,179	--	--
Total		129,414	182,097	140,059	159,240	151,510
Steel:						
Crude, secondary, plates		314,042 [r]	351,412 [r]	224,174 [r]	145,633 [r]	196,452
Semimanufactures, slabs		291,886	385,816	216,935	99,689	187,991
Lead concentrates:						
Gross weight		55,802 [r]	50,398 [r]	52,951 [r]	57,873 [r]	59,203
Pb content		31,249 [r]	28,223 [r]	29,653 [r]	32,409 [r]	33,154
Nickel, Ni content of FeNi		14,413	17,290 [r]	19,200 [r]	20,001	18,054
Zinc concentrates:						
Gross weight		65,743 [r]	56,264 [r]	56,074 [r]	61,815 [r]	63,140
Zn content		32,872 [r]	28,132 [r]	28,037 [r]	30,908 [r]	31,570
INDUSTRIAL MINERALS						
Cement	thousand metric tons	820	981	683	762	687
Clays, bentonite		12,798	14,463 [r]	6,900 [r]	26,819 [r]	19,166
Feldspar, crude		32,209 [r]	36,163 [r]	26,506 [r]	24,834 [r]	26,156
Gypsum, crude		143,118	162,984	157,844	162,661	156,492
Lime for cement		--	--	--	381	10,836
Limestone flux		1,063,839	1,142,662	818,559	976,452	753,429
Marl		749,750	861,666	954,495	788,049	660,827
Sand and gravel, construction (excluding quartz and quartzite)		64,789	2,443	124,442	126,773	154,256
Silica sands (quartz sands or industrial sands)		26 [r]	52 [r]	68 [r]	58 [r]	33
Stone, excluding quartz and quartzite:						
Crushed and broken		130,105	104,209	60,403	98,138	358,821
Dolomite:						
Agglomerated		4,748	5,249	5,392 [r]	5,100 [r]	5,542
Not frayed, not calcined		116,290	125,700	129,120	122,142	132,723
Sintered		20,625 [r]	25,032 [r]	17,168 [r]	14,334 [r]	15,576
Granite, crude		--	--	--	1,177	752
Marble and travertine, crude		52	53	76	144	548
Quartzite		6,595	49,590	16,865	35,899	73,698
Talc, crude		1,292	547	692 [r]	621 [r]	483
MINERAL FUELS AND RELATED MATERIALS						
Lignite	thousand metric tons	6,583	7,902	7,310	6,633	6,470
Petroleum, refinery products:						
Gasoline	thousand 42-gallon barrels	19,035	12,890	5,371	1,690	18
Kerosene	do.	2,463	3,476	2,141	600	--
Distillate fuel	do.	38,909	31,787	7,795	2,526	42
Liquefied petroleum gas	do.	2,105	1,701	849	243	--
Residual fuel	do.	11,002	6,090	2,404	1,083	12
Others	do.	38,985	36,870	14,425	3,121	--
Total	do.	112,499	92,814	32,985	9,263	72

[e] Estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through August 25, 2015.

[2] In addition to commodities listed, common clay, diatomite, gold, and lime were produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
MACEDONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, secondary	J.S.A. Teal Co.	Tetovo City	2,000
Do.	RZ Institute (Mines and Ironworks Institute AD)	Skopje	2,000
Cement	Cemetarnica USJE AD (Titan Group, 100%)	Plant at Skopje	2,100 [e]
Coal	AD ELEM	Brod-Gneotino, Mariovo, Negorino, Oslomej, Popvjani, Suvodol, and Zinojno	13,070
Do.	Concessionaires, privately owned companies	BRIK Berovo and Drimkol	140
Copper, gold, and silver:			
Ore	Solway Investment Group Ltd.	Mine and mill at Buchim, west of Radovis	4,000
Metal	do.	Solvent extraction and electrowinning plant at Buchim, west of Radovis	40
Feldspar	AD Nemetali Ograzden	Strumica	NA
Ferroalloys:			
Ferromanganese	Skopski Leguri DOOEL	Plant at Skopje	NA
Ferronickel, Ni content	FENI Industries (Cunico Resources)	Ferronickel plant at Kavadarci	78 [e]
Ferrosilicon	Jugohrom Ferroalloys DOO (Camelot Group)	Plant at Jegunovce	73
Silicomanganese	Skopski Leguri DOOEL	Plant at Skopje	NA
Lead-zinc concentrate	Solway Investment Group Ltd.	Mill at Sasa, north of Makedonska Kamenica	750
Lead-zinc ore	do.	Mine at Sasa, north of Makedonska Kamenica	1,000 [e]
Do.	Indo Minerals and Metals DOOEL	Zletovo Mine near Probistip	26
Do.	do.	Toranica Mine near Dolga Livada	NA
Lead-zinc, smelting	do.	Topilnica, City of Vesel	100
Lignite	AD ELEM (state owned)	Mine at Suvodol	6,500
Limestone	AD Nemetali Ograzden	Strumica	NA
Do.	do.	Mine at Oslomej	1,000
Do.	do.	Star Rudnik Mine at Oslomej	310 [e]
Do.	do.	Brod-Gneotino Mine, south of Suvodol near Brod	2,000
Marble	Mermeren Kombinat AD	Prilep	NA
Do.	Fox Marble Holdings plc	do.	NA
Petroleum, refined	OKTA A.D. Skopje (EL.P.ET Balkani S.A., 81.51%; Puko Petrol, 10.87%; company employees, 7.62%)	Oil refinery at Skopje	2,500
Steel, crude, secondary	Makstil A.D. Skopje (Duferco Group, 62.4%; Minyork Overseas Ltd., 19.4%; other shareholders 18.2%)	Plant at Skopje	360
Steel, semimanufactured	do.	do.	750 [e]
Do.	ArcelorMittal Skopje (ArcelorMittal)	do.	1,000

[e] Estimated. Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF MALTA

By Sinan Hastorun

Malta is a small, densely populated island country that is located in the central Mediterranean Sea, 100 kilometers (km) south of Italy and 290 km north of Libya. The three inhabited islands of Malta, Gozo, and Comino host few mineral resources except for clay, limestone, and salt, and no indigenous mineral fuel resources. Despite its small size, Malta plays an important role in world trade and has the potential to become a major international energy hub owing to its geographic location between the energy-intensive, industrialized countries of Europe and the mineral fuel producers of North Africa. Offshore hydrocarbon exploration in Malta's Continental Shelf is ongoing owing to the country's proximity to operating petroleum and natural gas fields in Italy, Libya, and Tunisia; however, no petroleum resources were identified as of yearend 2014 (Entec UK Ltd., 2003, p. 1; Continental Shelf Department, 2015b; Oil Exploration Unit, 2015; U.S. Department of State, 2015, p. 3).

In 2014, Malta produced construction aggregate (soft and hard limestone) from quarries located on the islands of Gozo and Malta. Although not significant on a regional or world scale, limestone production was an integral part of Malta's economy as a supplier to the construction industry, which made up about 3.6% of gross domestic product (GDP). Salt production increased owing to the ongoing restoration of salt pans; however, output was still low compared with its pre-1980 levels. Neither clay nor sand was extracted (table 1; Entec UK Ltd., 2003, p. 1–3; Carabott, 2013; Central Bank of Malta, 2015c, p. 50).

Minerals in the National Economy

In 2014, Malta's real GDP increased by 3.5% compared with that of 2013, and its economy continued to outperform most other European Union (EU) member states in terms of economic growth and employment. The nominal GDP in 2014 was 7.96 billion euros (EUR) ($10.15 billion[1]), which was up from EUR7.57 billion ($9.67 billion) in the previous year. The country's economic growth accelerated from 2.7% (revised) in 2013 owing to increases in private investment and consumption and Government spending. Large-scale ongoing energy projects as well as an increase in household disposable income as a result of lower electricity tariff rates contributed to domestic demand (Central Bank of Malta, 2015c, p. 43–45; European Commission, 2015a, p. 1; 2015b, p. 100; National Statistics Office, 2015a, p. 1).

The mineral sector constituted a minor component of Malta's economy, but it had important linkages with various other sectors, such as chemicals, construction, and nonmetallic manufacturing. In 2014, mining and quarrying output decreased by 22.7%, which was a downturn from the 6.1% increase recorded in 2013. The output of the energy sector decreased by 1.5% compared with a 2.0% decrease in the previous year. The mining and utilities sectors did not contribute to the growth in total gross-value added of 3.8% in 2014 compared with a 1.2% (revised) contribution in 2013. Mining and quarrying contributed 0.1% to growth in private sector employment from May 2013 to May 2014. The sector employed 303 full- and part-time workers as of May 2014 compared with 285 in May 2013 (Entec UK Ltd., 2003, p. 25; Economic Policy Department, Ministry of Finance, 2014, p. 46; Central Bank of Malta, 2015c, p. 46, 47; National Statistics Office, 2015c).

Government Policies and Programs

The Malta Resources Authority (MRA) is responsible for the regulation of mineral and water resources in Malta under the Malta Resources Authority Act of 2001. The MRA issues licenses for mineral exploration and extraction activity subject to environmental consideration and restoration requirements and determines which minerals may be extracted on Malta's islands. The MRA also implements Malta's mineral policy of ensuring mineral supplies for use in construction and minimizing excess mineral extraction and waste. The commercial extraction of blue clay was prohibited by Policy BC1 given its importance in the protection of the country's water supply (Entec UK Ltd., 2003, p. 104; Malta Resources Authority, 2012, 2014; Chetcui Cauchi Malta, 2015).

The Oil Exploration Unit of the Continental Shelf Department, which is a unit of the Ministry for Transport and Infrastructure, is responsible for the licensing and regulation of petroleum exploration within Malta's Continental Shelf, which includes negotiating production sharing contracts (PSC) with companies. Petroleum exploration and extraction is governed by the Petroleum Production Act of 1958, last amended by Act XXVI of 2014; the Continental Shelf Act of 2014; and the EU's Directive 94/22/EC of 1994 on exploration and production of hydrocarbons (Continental Shelf Department, 2015a; Oil Exploration Unit, 2015).

In November, the Government took the initial step towards establishing Malta as an international trading hub for mineral fuels and renewable energy products. Malta Enterprise, which is the national development agency responsible for promoting international investment in the country, formed a joint venture with International Energy Group of Singapore. The joint venture planned to establish Malta as a petroleum trading hub and eventually to expand into petroleum blending and bunkering activities (Pace and Coppini, 2015, p. 127).

Production

The major mineral commodities produced in Malta in 2014 were limestone and solar (evaporated) salt. Both were used locally, mostly in construction and lime manufacturing and food consumption, respectively. Construction aggregate output in the form of blocks, chippings, granules, and powder decreased from 2010 through 2012, in large part owing to the slowdown in construction activity, and then increased in 2013. In 2014, total limestone output decreased by3.8% as a result of decreases in the production of both hard limestone (3.4%) and soft limestone (9.5%). Increases were recorded only in the output of soft limestone chippings, granules, and powder (72%) and hard limestone (dimension stone) (12%). Salt production was estimated to have increased due to the ongoing rehabilitation of the Salina salt pans, though from a low base (Department of Contracts, 2014; National Statistics Office, 2015c).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783= US$1.00 for 2013.

Structure of the Mineral Industry

As of 2014, there were 55 active limestone quarries located on the islands of Malta and Gozo, which was down from 94 quarries reported in the Mineral Subject Plan of 2003 (of which 28 were hard limestone quarries and 66 were soft limestone quarries). The soft limestone quarries were concentrated in the Mqabba and Siggiewi areas on Malta and in Dwejra on Gozo. The hard limestone quarries were less concentrated across the country. They were located in western and southern Malta and eastern Gozo. The total area recorded for quarrying on Malta and Gozo accounted for 0.8% of the total land area, which was significant in a small and densely inhabited urban country (Entec UK Ltd., 2003, p. 1, 2, 41; National Statistics Office, 2015c).

Both soft and hard limestone quarries were privately owned and operated as individual businesses that comprised single operational units. The small-scale, private, domestic-ownership structure of quarries reflected the production structure in Malta's broader economy. Larger industrial firms operated 35 concrete batching plants and 9 tarmac plants within hard limestone quarries (table 1; Entec UK Ltd., 2003, p. 2; European Commission, 2013, p. 17).

In July 2014, Urion Holdings Malta, a subsidiary of Trafigura Beheer BV of the Netherlands, which was a leading global commodities trading and logistics company, acquired an 18% share of EMED Mining Public Ltd. of Spain, a leading mining company with copper and gold properties across Europe. Trafigura had three other subsidiaries in Malta: Trafigura Holdings, Trafigura Nat Gas, and Trafigura Maritime Ventures (Vella, 2014).

Mineral Trade

In 2014, Malta's trade deficit increased by 47.4% to reach EUR2.6 billion ($3.3 billion). Exports of goods and services decreased by 0.2%, while imports increased by 0.1% primarily owing to increases in private and public investment. The mineral-related sectors of Malta's economy depended almost completely on imports, the reexporting of raw materials and fuels, and the storage of crude petroleum. In 2014, the increase in imports was mainly owing to the increase in imports of lubricants, mineral fuels, and related materials. Imports of these mineral commodities accounted for nearly 40% of imports and increased by 14.3% by value compared with that of 2013. Among Malta's exports, lubricants, mineral fuels, and related materials were again the leading category. Exports from this category accounted for almost 43% of merchandise exports in 2014, but decreased in value by 3.4% compared with that of 2013. The decrease in exports of these mineral commodities was the second leading contributor to the decrease in Malta's total exports in 2014 (Central Bank of Malta, 2015c, p. 43–45, 85; National Statistics Office, 2015b, p. 1).

Other EU member states continued to be Malta's principal trading partners, but their share in Malta's trade decreased. In 2014, they received 29.5% of Malta's total exports compared with 31.7% (revised) in 2013, and supplied 50.2% of its total imports in 2014 compared with 57.8% (revised) in the previous year, contracting 2.2% and 7.6%, respectively. Asian countries, in particular China, accounted for 20.6% of Malta's exports and 11.5% of its imports. Malta's exports to the United States were valued at $173 million, with a 4.4% share. Mineral commodity exports to the United States included petroleum products valued at $4.8 million; stone, sand, and cement valued at $790,000; fertilizers valued at $618,000; and iron and steel valued at $93,000. Malta's imports from the United States were valued at $969 million and had a 9.6% share, which was almost triple that of 2013. Mineral commodity imports from the United States included fuel oil valued at $828.2 million, finished metal shapes valued at $1.9 million, and iron and steel products valued at $797,000 (Central Bank of Malta, 2015a, b; 2015c, p. 85, 86; U.S. Census Bureau, 2015a, b).

Commodity Review

Industrial Minerals

Salt.—In 2014, Malta's salt output remained lower than that of the 1970s when it reached its peak level. Work continued on the restoration of the Salina salt pans, which had been damaged by storms and flooding in earlier decades. Salt was produced using small-scale coastal salt evaporation pans called Mediterranean Salinas that were carved out of rock, but the lack of extensive flat areas in proximity to the shoreline in Malta prevented production on an industrial scale. The Salina Bay salt pans in northern Malta had produced about 4,000 metric tons of salt annually over two harvests on an artificial island until 1979. An estimated 40 sites scattered around the islands of Gozo and Malta contained salt pans, but very few of the pans were actively harvested. The Salini Rehabilitation Project to restore, conserve, and use 35 salt pans at Salina Bay was approved in February 2011 with 75% funding support by the EU and began in December 2011. Work was originally scheduled to be completed by September 2013, but a new tender was awarded by the Department of Contracts in April 2014 for the project (Entec UK Ltd., 2003, p. 2; Malta Environment and Planning Authority, 2011; Carabott, 2013; Department of Contracts [Malta], 2014; Jung, 2014; European Network for Rural Development, 2015).

Mineral Fuels

Petroleum and petroleum products accounted for almost 100% of Malta's energy supply and were wholly imported. Renewable energy sources met only about 1.0% of gross inland energy consumption in 2012 (the latest year for which data were available), which was the lowest percentage among all

28 member states of the EU (Department of Energy [European Commission], 2014, p. 156; European Commission, 2014, p. 6, 9).

Natural Gas.—In 2014, Malta did not produce any natural gas, but the Government took further steps towards switching domestic energy consumption from fuel oil to natural gas as a cheaper and cleaner source of energy, which would also reduce the country's dependence on imported petroleum. In March 2014, planning permits were issued for the construction of a new 215-megawatt (MW) gas-fired electricity plant and related liquefied natural gas (LNG) storage facilities at the Delimara power station. The gas facilities would also supply Enemalta's existing Delimara phase 3 plant, which would be converted to operate on natural gas. In December 2014, the Government announced that the construction of the plant by an international consortium was delayed and would now be commissioned by June 2016 instead of March 2015 as originally planned (Enemalta Corp., 2014; Gasol plc., 2014; Pace and Coppini, 2015, p. 127).

Petroleum.—In May 2014, Mediterranean Oil and Gas Ltd. (MOG) of the United Kingdom and Genel Energy plc. of Turkey and the United Kingdom began drilling the Hagar Qim 1 exploration well in Block 7, Area 4, south of Malta, which was the first exploration well drilled offshore Malta since 2002. In July, MOG reported that the well was plugged and abandoned with no indications of commercially exploitable hydrocarbon resources at the Eocene (rock) layer, which had been previously estimated to hold resources of 109 million barrels of oil equivalent. Genel Energy was granted a 6-month extension to its PSC in order to evaluate the results of the well and to decide whether to enter into the second exploration phase for Area 4. The company subsequently moved the Paul Romano rig from Malta to the Nour prospect on the Sidi Moussa block offshore Morocco for drilling in the latter instead (Malta Today, 2014; Rigzone, 2014; Pace and Coppini, 2015, p. 128; Subseaiq, 2015).

As of yearend 2014, Areas 2 and 7 offshore east of Malta were licensed to Heritage Oil of Jersey. Blocks 1, 2, and 3 of Area 3 north of Malta were licensed to Capricorn Malta Ltd., which was a subsidiary of Cairn Energy plc. of the United Kingdom, and Melita Exploration Company Ltd., which was a subsidiary of Rockhopper Exploration plc. of the United Kingdom, under an Exploration Study Agreement. Area 5 southwest of Malta was licensed to Ratio Malta Ltd., which was an affiliate of Ratio Oil Exploration Ltd. of Israel under an Exploration Study Agreement (Continental Shelf Department [Malta], 2015b).

Outlook

Malta's mineral production is expected to remain modest. Limestone production from quarries is likely to remain the country's main mineral output and may increase in line with the continued growth of the residential and commercial construction industry. Salt production is expected to increase in the coming years with the completion of the Salina Bay salt pans restoration project. Malta is likely to remain a nonproducer of hydrocarbons, as recent petroleum exploration in its territorial waters in the Mediterranean Sea has not yielded commercially viable reserves. Imports and consumption of petroleum are expected to decrease further while those of natural gas should increase as the country transitions away from fuel oil to natural gas for power generation.

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TABLE 1
MALTA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons)

Commodity[2]	2010	2011	2012	2013	2014
Limestone:					
Hardstone:					
Chippings, granules, and powder	1,739,649	1,735,630	1,707,414	1,825,681 [r]	1,758,664
Dimension stone	57,981	26,573	28,853	30,852 [r]	34,424
Total	1,797,629	1,762,203	1,736,267	1,856,533 [r]	1,793,087
Softstone:					
Chippings, granules, and powder	15,279	5,299	2,366	3,035 [r]	5,221
Dimension stone	116,716	113,378	102,874	131,939 [r]	116,929
Total	131,995	118,678	105,240	134,974 [r]	122,150
Grand total	1,929,624	1,880,881	1,841,507	1,991,507 [r]	1,915,237
Salt, solar[e]	1,000	1,000	1,000	1,000	1,500

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised.

[1] Table includes data available through June 5, 2015.

[2] In addition to the commodities listed, small amounts of cement, fertilizer, and plaster were produced, but available information is inadequate to make reliable estimates of output.

THE MINERAL INDUSTRY OF MOLDOVA

By Elena Safirova

Moldova had a small mineral industry of limited regional significance that was engaged primarily in the mining and production of industrial minerals and mineral products, including cement, clays, gypsum, limestone, and sand and gravel. The breakaway Transnistria region had a minimill metallurgical plant, a cement plant, and some other industrial plants, but the Moldovan statistical agency did not report production for the Transnistria region. The country was completely dependent on imports for its coal, natural gas, and refined petroleum products, which came mainly from Russia and Ukraine. Moldova's main mineral resources were industrial minerals, which were used to produce construction materials and as inputs for the cement, chemical, food processing, and glass industries. Small deposits of iron ore, natural gas, and oil had been explored in the past but still were not determined to be economic to develop.

In 2014, Moldova imported almost 100% of its natural gas from Russia. At the same time, the country was working on developing alternatives to Russia's energy sources. In August, it was reported that the Yassy-Ungeny gas pipeline (a pipeline between the city of Yassy in Romania and the city of Ungeny in Moldova) was completed. The completion of construction technically meant that Moldova was included in the energy system of the European Union (EU). The total cost of the pipeline was estimated to be EUR20 million ($25.5 million),[1] and was financed by the European Union as a part of the EU's Moldova-Romania-Ukraine Joint Operational Program for the period 2007 through 2013. Romania planned to immediately start shipments of natural gas to Moldova, but, at yearend, the negotiations about shipments were still underway. It was clear, however, that shipments from Romania could decrease Moldova's dependence on Russia's natural gas by 5%, from 100% to 95%. Moreover, Romania itself did not have enough gas to satisfy its domestic demand, and had to purchase from Russia between 22% and 42% of its domestic demand. It was expected that by 2020 Romania would increase its natural gas production, and Moldova would be able to substitute imports from Romania for natural gas from Russia (Regnum.ru, 2013b; 2014a–c).

Minerals in the National Economy[2]

In 2014, the nominal gross domestic product (GDP) of Moldova, according to the preliminary data, was $7.94 billion; real GDP increased by 4.6% compared with that of 2013. Industrial production contributed 33.0% to the GDP in 2014; the share of mining and quarrying output in total industrial production was 1.8%. In 2014, industrial production increased by 7.3% compared with that of 2013; the output in mining and quarrying and manufacturing increased by 0.2% and 8.5%, respectively, whereas the output of the energy sector increased by 4.4%. The output of the chemical sector increased by 42.4%, and the production of other nonmetal mineral products (such as cement, concrete, glass, and gypsum) increased by 2.6% (National Bureau of Statistics of the Republic of Moldova, 2015; U.S. Central Intelligence Agency, 2015).

In 2014, the Moldovan trade deficit decreased by 3.0% to $2.98 billion; the value of exports decreased by 3.7% to $2.34 billion, and that of imports decreased by 3.2% to $5.32 billion. In 2014, Moldova was a net importer of mineral commodities; the total value of mineral exports amounted to $39.7 million, and the total value of mineral imports was $1.10 billion. Moldova was a net importer of pig iron and steel (exported materials were worth $4.8 million and imported materials were worth $133.0 million); of nonferrous metals (exports of $2.1 million and imports of $67.0 million); and of articles made out of metals (exports of $22.0 million and imports of $137.2 million). The major export categories were foodstuffs, machinery, and textiles, and the main export trade partners were Romania (which received 18.6% of Moldova's exports), Russia (18.2%), Italy (10.4%), Germany (5.9%), Belarus (5.8%), Ukraine (4.7%), the United Kingdom (4.6%), and Turkey (4.5%). Moldova imported chemicals, machinery and equipment, mineral products and mineral fuels, and textiles. The country's major import trade partners were Romania (which supplied 15.1% of Moldova's imports), Russia (13.5%), Ukraine (10.3%), China (9.0%), Germany (8.0%), Italy (6.6%), and Turkey (5.7%) (National Bureau of Statistics of the Republic of Moldova, 2015; U.S. Central Intelligence Agency, 2015).

Production

In 2014, production of rolled steel increased by 112%, and that of crude steel, by 81%, compared with production levels in 2013. Cement production increased by an estimated 13% and sand and gravel production, by an estimated 8.5%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Most mineral industrial facilities in Moldova were privately owned. Both cement plants had foreign owners (Lafarge S.A. of France and Metalloinvest Holding Co. of Russia), and the only metallurgical plant was also controlled by Metalloinvest, although it was officially owned by OOO Greenan Holdings Ltd. Table 2 lists major mineral industry facilities.

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[1] Where necessary, values have been converted from Moldovan lei (MDL) to U.S. dollars (US$) at an annual average exchange rate of MDL14.042=US$1.00 for 2014, MDL12.592=US$1.00 for 2013, and from euro area euros (EUR) to U.S. dollars at an annual average exchange rate of EUR=0.783=US$1.00 for 2013.

[2] The data cited in this section do not include Transnistria region and Bendery municipality.

Commodity Review

Metals

Iron and Steel.—In 2014, OAO Moldovan metallurgical plant (MMZ), which was located in the Transnistria region, produced 344,470 metric tons (t) of crude steel and 391,228 t of rolled steel, which was an increase of 81% and 112%, respectively, compared with production in 2013. The plant's annual capacity was 1.1 million metric tons per year (Mt/yr), but the last time that the plant operated at capacity was in 2005. In 2013, MMZ was idle for 7 months because, at the beginning of 2013, the Transnistria authorities increased electricity rates, which made steelmaking at the plant unprofitable. In June 2013, the plant's owners and the Transnistria authorities met and the authorities offered a support package to the plant's owners; the details of the package were not disclosed. In 2014, MMZ continued operations amid reduced demand for its output and difficulties with purchasing metal scrap as a raw material. MMZ shipped its products to Moldova, Poland, Romania, Russia, and Ukraine (NOI.md, 2013b; NovostiPMR.com, 2014b; Infogeo.ru, 2015).

Industrial Minerals

Cement.—The two leading cement producers in Moldova were Lafarge Ciment Moldova SA (a part of Lafarge S.A. of France), which was located in the city of Rezina in the northern part of Moldova, and the ZAO Rybnitsa cement complex (RCK), which was located in the Transnistria region (table 2). Cement production in Moldova in 2014 was estimated to have increased by 13% because RCK increased production by 42% (NewsMoldova.md, 2014; NovostiPMR.com, 2014a).

Lafarge purchased the Rezina cement plant in 1999 and since then invested about EUR50 million (about $63.9 million) to modernize the plant, which, as of 2014, had the capacity to produce 1.4 Mt/yr of cement. Lafarge expanded its presence in Moldova by opening the concrete testing center in Chisinau in 2011 and the Comrat rail terminal in the southern part of the country in 2013 (Gagauzinfo.md, 2013; Lafarge S.A. Moldova, 2015).

In April 2014, Lafarge and Holcim Ltd. of Switzerland announced their plan to merge and to form the world's largest cement maker with $40 billion in annual revenue. To win regulatory approval, the companies planned to sell about $6.4 billion worth of assets; the Rezina plant was not expected to be sold. The merger was expected to be finalized in the summer of 2015. It was not immediately clear what, if any, effect the merger would have on the operations of the Rezina plant (Winters and De Beaupuy, 2014).

The RCK produced cement and lime for use in construction. The plant had the capacity to produce 1.1 Mt/yr of cement but had not produced at capacity since 2008. In 2014, the RCK produced 494,200 t of cement, which was a 42% increase compared with the 2013 output. As of 2014, the major shareholder of the plant was Metalloinvest Holding Co. of Russia (NewsPMR.com, 2013; Rupor PMR, 2013; NOI.md, 2015).

Mineral Fuels

Natural Gas and Petroleum.—In 2014, Valiexchimp SRL was the only company producing crude oil and natural gas in Moldova. Both petroleum and natural gas deposits were located in the southern part of Moldova. Valiexchimp had exclusive rights for development of deposits near the villages of Valeni and Viktorovca, where it was producing up to 12,000 cubic meters of natural gas per month and up to 1,000 t of petroleum per month (exact production figures were not reported). According to some estimates, production could be increased if the depth of the wells was increased to 4 kilometers, but it was not clear if such an investment would be profitable (Lyabina, 2011; Nedova, 2013; NOI.md, 2013a).

Canyon Oil and Gas Ltd. of the United Kingdom was founded in 2011 and was planning to explore for and produce natural gas and petroleum in Moldova. In particular, the company was interested in exploration for shale oil and gas. At the end of 2013, Canyon Oil and Gas was acquired by Aminex plc of Ireland. At yearend 2014, it was not clear how the company's operations in Moldova would be affected by the acquisition (Regnum.ru, 2013a; Sholar, 2013).

Outlook

In 2014, Moldova's economy grew by 4.6%, although the Transnistrian economy continued to struggle. Moldova took a decisive step in the direction of energy independence from Russia by constructing a gas pipeline between Romania and Moldova. It remains to be seen how reliable Romania's shipments of natural gas will be and how soon they will be able to meet a large portion of Moldova's demand. Regardless of future economic growth, Moldova is likely to remain a small producer of mineral commodities, specializing in the production of industrial minerals used in construction.

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TABLE 1

MOLDOVA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons)

Commodity[2]	2010	2011	2012	2013	2014
METALS					
Steel:					
Crude	241,500	320,600	316,682	190,086	344,470
Rolled	231,400	306,500	356,754	184,676	391,228
INDUSTRIAL MINERALS					
Cement[e]	900,000	1,000,000	1,200,000	1,150,000	1,300,000
Clays, unspecified[e, 3]	160,000	140,000	150,000	165,000	170,000
Gypsum[3]	99,800	100,540	115,100	120,000 [e]	125,000 [e]
Lime[e]	5,000	5,500	12,000	12,500	12,500
Limestone[3]	196,900	295,500	279,160	253,200	250,000 [e]
Sand and gravel[3]	2,146,000	2,547,000	3,042,000	3,501,500	3,800,000 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits.

[1] Table includes data available through June 17, 2015.

[2] In addition to the commodities listed, Moldova was thought to have produced granite, natural gas, peat, and petroleum, but available information was inadequate to make reliable estimates of output.

[3] Excludes the Transnistria region.

TABLE 2
MOLDOVA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Lafarge Ciment Moldova SA	Rezina	1,400,000
Do.		ZAO Rybnitsa Cement Complex (RCK) (Metalloinvest Holding Co.)	Rybnitsa, Transnistria region	1,100,000
Granite	thousand cubic meters	NA	Kosoutskoye deposit	150
Gypsum		CMC-Knauf joint venture	Kirovskoye deposit	850,000
Oil and natural gas:				
Oil		Valiexchimp SRL	Valeni oilfield	NA
Natural gas		do.	Victorovca gasfield	NA
Sand and gravel		NA	Throughout the country	NA
Steel, crude		OAO Moldovan metallurgical plant (MMZ) [OOO Greenan Holdings Ltd. (98.83%)]	Rybnitsa, Transnistria region	1,100,000

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF MONTENEGRO

By Sinan Hastorun

Montenegro is a European Union (EU) candidate country located in the western Balkan Peninsula that borders Albania, Bosnia and Herzegovina, Kosovo, and Serbia. The country produced a limited number of mineral commodities, none of which was regionally or globally significant, but it has the potential to become a regionally important coal and hydrocarbon producer. Montenegro's mineral industry included the mining and processing of bauxite, industrial minerals, and lignite coal. Metal production included alumina refining, primary aluminum smelting, and steelmaking. The country's mineral industry underwent a recovery in 2014 after its largest mineral company and sole aluminum producer, Kombinat Aluminijuma Podgorica (KAP), resumed production and its leading bauxite producer, Rudnici Boksita, increased its output. Iron and steel production continued to increase as Tosçelik Niksic A.D., which was Montenegro's primary iron and steel company, continued its plant modernization program. Montenegro's first tender for offshore hydrocarbon exploration and extraction received bids from foreign companies for all blocks that were offered for concession in the country's Exclusive Economic Zone (EEZ) in the Adriatic Sea (tables 1, 2; Bağrık, 2014; Dimitrievska, 2014b; Ministry of Economy, 2014a; MnNews, 2014b; Prekic, 2014b).

Minerals in the National Economy

In 2014, Montenegro's real gross domestic product (GDP) increased by 1.8%, down from a 3.5% rate of growth in 2013. The nominal GDP in 2014 was $4.6 billion. The economic slowdown was owing to a deceleration in construction activity, which was attributed to delays in infrastructure projects and to decreased exports as a result of lower demand by Montenegro's neighboring trading partners in the Balkan Peninsula. Mineral production, in particular that of base metals, increased, while industrial production contracted in 2014 in large part owing to a substantial decrease in electricity generation (European Commission, 2014, p. 29; 2015, p. 128; International Monetary Fund, 2015, p. 4; Statistical Office of Montenegro, 2015b, p. 2; World Bank, 2015a; b, p. 2).

The minerals industry continued to be a small component of Montenegro's GDP, although its share of GDP increased in 2014. Mining and quarrying made up 1.1% of gross output in constant prices, which was a slight increase from 1.0% in the previous year, while manufacturing accounted for 3.9%, which was a decrease from 4.2% (revised) in 2013. The gross value added by the mining and quarrying sector in constant prices decreased by 0.1% in 2014 compared with a decrease of 6.9% in 2013, while the gross value added by the manufacturing sector decreased by 2.1% compared with an increase of 6.5% (revised) in 2013 (Statistical Office of Montenegro, 2015b, p. 6, 8).

Mining and quarrying output increased by 14.4% in 2014 compared with that of 2013, while industrial production decreased by 11.4% compared with that of 2013. Within mining and quarrying, output of metal ore increased by 214.9% owing in large part to increased aluminum and bauxite production, while output of coal and lignite decreased by 2.1%. Manufacturing output decreased by 6.7% in 2014 compared with that of 2013. Within manufacturing, output of nonmetallic mineral products increased by 0.4%. Output of fabricated metal products decreased by 86.6%; base metals, by 15.5%; and chemicals and chemical products, by 0.3%. Energy production, including electricity, gas, and steam, decreased by 19.6% in 2014 (Statistical Office of Montenegro, 2015c, p. 2).

Government Policies and Programs

Montenegro continued to align its legal framework, including its mining and energy laws, with EU legislation as a precondition of membership. In July 2014, the Government adopted the Energy Development Strategy through 2030 in order to establish a competitive market in the distribution and sale of mineral fuels and electricity in accordance with the Third Energy Package of the European Energy Community. As of yearend 2014, the Ministry of Economy was in the process of drafting a National Renewable Energy Action Plan in accordance with the European Commission's Renewable Energy Directive 2009/28/EC-Decision 2009/548/EC, that aimed to increase the share of renewable energy sources in final energy consumption to 33% by 2020. Montenegro had no strategic reserves of crude petroleum, no established internal gas market, and had not yet adopted a national renewable energy action plan (European Commission, 2014, p. 14, 29, 30; Ministry of Economy, 2015, p. 1; Moravcevic and Lakovic, 2015, p. 133).

The Law on the Protection of National Interests in the Mining-Metallurgical Sector (Official Gazette of Montenegro No. 58/13), which had been adopted by the Parliament in 2013, was found unconstitutional by the Constitutional Court of Montenegro in April 2014. The law had stipulated a requirement of prior approval by the Parliament before a sales agreement could be concluded for the transfer of a bankrupt mining or metallurgical company to a new owner. With the voiding of the law, the bankruptcy court remained the sole authority in the sale of such companies (Constitutional Court of Montenegro, The, 2014; Ministry of Economy, 2014b).

The Government undertook further steps to establish the legal framework for exploration and exploitation of offshore mineral fuel resources and thereby diversify national energy sources and increase public revenues. In July 2014, the Parliament adopted the Law on Hydrocarbons Tax, Law No. 31/2014, which enacted the tax policy on profits generated by extraction, production, transportation, and delivery of oil and gas. The tax rate for hydrocarbon upstream operations was set at 54% (Ministry of Economy, 2014c; Moravcevic and Lakovic, 2015, p. 131).

Production

Montenegro experienced substantial increases in the production of all its mineral commodities except for gravel, lime, and salt in 2014. Aluminum production resumed after stopping in 2013, while bauxite and steel production increased. Production of alumina and lime ceased in 2010 and 2012, respectively. Lignite production continued to decrease, albeit at a lower rate. In 2014, production of aluminum increased by about 177% compared with that of 2013; bauxite, by 154%; sand, by 115%; crushed and broken stone, by 64%; other stone products, by 29%, and ornamental stone (marble blocks), by 12%. On the other hand, production of salt ceased and that of gravel decreased by 24% (table 1).

Structure of the Mineral Industry

The leading production companies in the minerals industry were privately owned, with the exception of bauxite producer Rudnici Boksita. KAP, the main aluminum producer, which had been nationalized following its bankruptcy in October 2013, was privatized in July 2014 through a sale to Uniprom of Montenegro. Rudnici Boksita, which had been jointly owned by the Central European Aluminum Co. (CEAC) of Cyprus and the Government of Montenegro until its bankruptcy in February 2014, was being operated by a public bankruptcy administrator pending a tender for the sale of its assets. Rudnik Uglja A.D. coal company was jointly owned by the A2A Group of Italy and the Government of Montenegro. Tosçelik Niksic A.D., the main steel company in the country, was wholly privately owned by the Tosyalı Group of Turkey. Table 2 is a list of major mineral industry facilities (table 2; Dimitrievska, 2014d, e; Rudnik Uglja A.D., 2015; Toscelik Niksic A.D., 2015).

Mineral Trade

Raw materials, including such crude materials as metalliferous ores and metal scrap, were Montenegro's second leading export category in 2014 and made up 21% of all exports, which was an increase from 16% in 2013. Mineral fuels, lubricants, and related materials were the country's third leading export category and accounted for 15% of exports, which was a decrease from 29% in 2013. In 2014, nonferrous metals were Montenegro's leading export goods; the value of these exports decreased by 10% compared with 2013 to EUR71.9 million ($91.7 million[1]). Exports of metalliferous ores and metal scrap decreased by 2% to $42.3 million; those of petroleum and petroleum products, by 18% to $11.6 million; iron and steel, by 63% to $5.7 million; metal manufactures, by 24% to $2.7 million; and nonmetallic mineral manufactures, by 62% to $2.0 million. Exports of coal, coke, and briquets increased by 23% to $1.9 million (Statistical Office of Montenegro, 2015a, p. 8, 10, 11).

Mineral fuels, lubricants, and related materials were Montenegro's third leading import category and made up 13% of all imports in 2014, which was a decrease from 15% in 2013. Raw materials accounted for 3% of imports, which was a decrease from 4% in 2013. In 2014, imports of petroleum and petroleum products were Montenegro's leading import good; the value of these imports decreased by 3% compared with 2013 to $236.2 million. Imports of nonmetallic mineral manufactures increased by 2% to $96.3 million; metal manufactures, by 3% to $78.2 million; and iron and steel, by 3% to $53.6 million. Imports of metalliferous ores and metal scrap decreased by 21% to $32.3 million; nonferrous metals, by 1% to $17.0 million; natural gas, by 1% to $15.4 million; and coal, coke, and briquets, by 5% to $0.8 million (Statistical Office of Montenegro, 2015a, p. 9, 12, 13).

Montenegro's exports to the United States were valued at $2.7 billion in 2014 compared with $1.7 billion in 2013. Mineral exports included $14,000 in finished metal shapes. Montenegro's imports from the United States were valued at $18.2 million compared with $21.7 million in 2013. Mineral imports included chemicals, $23,000, and iron and steel products, $6,000 (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Bauxite, Alumina, and Aluminum.—The production of aluminum and bauxite resumed in Montenegro in 2014, while there was no alumina production. KAP, which was the country's sole aluminum producing company and had accounted for about 5% of Montenegro's GDP in 2012, was acquired by Uniprom of Montenegro for $36 million in June 2014. The company had been declared bankrupt and nationalized in October 2013 owing to outstanding debts. Uniprom pledged to invest $97 million over the next 4 years to modernize the Podgorica smelter. After taking over operations in July 2014, Uniprom canceled KAP's exclusive contract with Glencore Plc of Switzerland, which had been the sole buyer of its aluminum output since 1998. As of October 2014, aluminum production at the Podgorica smelter increased to 3,700 metric tons per month. Uniprom planned to increase monthly production to 6,000 metric tons (t) as part of the modernization program, which would more than double KAP's annual aluminum output in 2014 (Savic, 2013; Vasovic, 2013; Dimitrievska, 2014a; Emerging Markets Direct Media Holdings, 2014; Prekic, 2014b; Tomovic, 2014; International Monetary Fund, 2015, p. 9)

As of yearend 2014, the Government had not yet received full payment for the sale of KAP, and a lawsuit over the company's nationalization and subsequent privatization was pending. In July 2014, Uniprom obtained a 2-month extension on payment following an injunction issued by the District Court of Nicosia, Cyprus, on all transactions involving KAP's assets, including their transfer to new ownership. The court case had been filed in December 2013 by En+ Group of Russia, which was the parent company of KAP's former owner, Central European Aluminum Company (CEAC) of Cyprus, alleging breaches of agreements signed with the Government in 2005 and 2009 over ownership shares and the price of electricity supplied to the Podgorica smelter. In September 2014, Uniprom paid $5 million to the

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783=US$1.00 for 2013.

Government and obtained another 6-month extension on the remainder of payments (Dimitrievska, 2014c; Nuttall, 2014; Petrushinin, 2014; International Monetary Fund, 2015, p. 9).

Bauxite production at Rudnici Boksita was halted and restarted multiple times throughout the year after the company declared bankruptcy in February 2014. Insolvency proceedings against the company had been launched in November 2013 over nonpayment of debt owed to Crnogorska komercijalna banka a.d. Podgorica (CKB), which was a local bank and a subsidiary of OTP Bank of Hungary. Rudnici Boksita resumed production at its Zagrad Mine in June 2014 to deliver 20,000 t of ore per month to Neksan of Montenegro. The two companies had signed a sales contract following Rudnici Boksita's invitation for business and technological partnerships in March 2014. Also, in June 2014, the assets of Rudnici Boksita were put up for sale for $18 million, but no bids were received. In October 2014, Neksan resumed bauxite production at the Zagrad Mine. In December 2014, following another public call for a partnership arrangement with Rudnici Boksita, Neksan placed a bid to jointly produce between 20,000 t and 23,000 t of bauxite ore per month, while Vagon Impex of Hungary offered to produce 12,000 t of ore per month (Dimitrievska, 2014a, b, f; 2015c; MnNews, 2014a).

Copper, Lead, and Zinc.—Balamara Resources Ltd. of Australia divested the Monty copper, lead, and zinc project by selling its wholly owned subsidiary Balkan Mining Pty. Ltd. to a consortium of European investors in November 2014. The Monty project comprised three deposits (Brskovo, Visnjica, and Zuta Prla) in Mojkovac, which is located about 100 kilometers (km) from Podgorica, with a combined indicated and inferred resource of 9.15 million metric tons (Mt) with grades of 3.90% zinc, 1.28% lead, and 0.31% copper. Although Balamara originally planned to bring the Monty project into production in 2014, it subsequently decided to divest its noncore base-metal projects in Balkan countries, including Montenegro, and to fund projects elsewhere, such as coal projects in Poland and a potential phosphate project in Togo (Balamara Resources Ltd., 2013, 2014; Proactive Investors, 2014).

Iron and Steel.—The modernization program at Tosçelik Niksic, which had been launched in 2012 under new ownership, continued in 2014. In March 2014, Tosçelik, which was a subsidiary of Tosyalı Group of Turkey, reported that it had invested over $8 million in the Niksic iron and steel mill plant since acquiring the company and would invest a total of $45 million by 2017 in equipment upgrades in order to increase output and to meet environmental standards. Tosçelik planned to increase annual steel production at Niksic to 200,000 t and annual revenue to about $255 million in 2016 (Bağrık, 2014; Dimitrievska, 2014g).

Industrial Minerals

Cement.—Montenegro did not have its own cement production facilities and imported cement from Albania, Croatia, Greece, and Serbia to meet all its cement demand. Domestic cement consumption was about 0.25 million metric tons per year (Mt/yr). In May 2013, the Crnogorski Cement Pljevlja company was established by the municipality of Pljevlja and SFERA Group of Russia. The company planned to build a cement plant in Pljevlja through a $306 million investment project. The SFERA Group also expressed interest in developing the Jagnjilo marl deposits in Pljevlja. No further updates were reported as of yearend 2014 (International Cement Review, 2013; 2015, p. 237).

Mineral Fuels

In 2013 (the latest year for which comprehensive data were available), Montenegro's primary energy supply sources were coal (39%), petroleum and petroleum products (36%), and renewable sources (biomass and hydropower) (24%). The country depended on domestic coal production and imported petroleum and electricity to cover its national energy consumption (Statistical Office of Montenegro, 2015d, p. 7, 8).

Coal.—Coal production in Montenegro was not significant by world standards and continued to decrease. Coal was an important source of energy for the country, however, as coal-fired powerplants accounted for about 25% of domestic electricity generation. Rudnik Uglja A.D.'s Pljevlja's Mine at Pljevlja produced all the country's coal and supplied the Pljevlja thermal powerplant (TPP Pljevlja), which accounted for 43.6% of the power generated in 2014 by Montenegro's only power utility company Elektroprivreda Crne Gore A.D. Nikšić (EPCG). EPCG planned to add a new coal-fired unit at its Pljevlja powerplant. In May 2014, the company announced that Hubei Electric Power Survey & Design Institute of China offered the lowest bid for the construction of a unit with a capacity of 220 to 300 megawatts (MW) (European Commission, 2013, p. 4; Thomson Reuters, 2014; Dimitrievska, 2015b; Elektroprivreda Crne Gore A.D. Nikšić, 2015).

Metalfer Group of Serbia acquired in March 2014 from Balkan Energy of Greece the inactive Berane underground coal mine, which had estimated "geologic resources" of 130 Mt and extractable resources of 50 Mt. In March 2013, Metalfer launched a mine prospects analysis at Berane jointly with Premogovnik Velenje of Slovenia, and planned to produce 40,000 t of coal in the mine's first year of production and 80,000 t in the second year when it became active (Dimitrievska, 2014e; Vibilia SEEbiz, 2014; Metalfer Group, 2015).

Petroleum and Natural Gas.—Montenegro did not produce any petroleum or natural gas in 2014, but the country took steps toward commencing the exploration of offshore hydrocarbon resources in the Adriatic Sea. In May 2014, the tender for hydrocarbon exploration and exploitation was closed for 13 blocks of identified prospects within the Dinarides Thrust Belt and in the adjacent Adriatic-Ionian foreland basin. The public invitation for Montenegro's first-ever tender had been issued by the Ministry of Economy in August 2013. The concession was divided into phases: the exploration phase, with a maximum duration of 6 years and a possible extension of up to 2 years, and the exploitation phase, with a maximum duration of 20 years and a possible extension of up to 10 years. Three international consortia consisting of six companies, Marathon Oil Corp. of the United States and OMV GmbH of Austria; ENI S.p.A. of Italy and Novatek of

Russia; and Mediterranean Oil and Gas Plc. of the United Kingdom and Energean Oil and Gas SA of Greece, submitted bids for five, four, and three offshore blocks, respectively. In December 2014, the Ministry announced that negotiations on concession contracts with the consortia would be completed by February 2015 (Komnenic, 2014; Ministry of Economy, 2014a; White, 2014; Dimitrievska, 2015a; Moravcevic and Lakovic, 2015, p. 131).

In April 2014, the Government of Montenegro filed a formal complaint against the Government of Croatia at the International Court of Justice in the Hague over Croatia's issuing of a tender for oil and gas exploration offshore Prevlaka in the Adriatic Sea, which both countries considered to be its territory. The two former republics of Yugoslavia lacked officially determined boundaries on the Prevlaka Peninsula and in the southern Adriatic Sea since the disintegration of Yugoslavia in 1991 (Prekic, 2014a; Avramovic, 2015).

Montenegro was a party to the proposed Ionian Adriatic natural gas pipeline project to connect Croatia with Albania with a north-to-south flow capability. In May 2013, Albania, Bosnia and Herzegovina, Croatia, and Montenegro signed a memorandum of understanding for the development of the project. In September 2014, the construction of the pipeline was launched with an official groundbreaking ceremony that was held in Azerbaijan. The proposed pipeline would transport natural gas from the Caspian Sea through Turkey and the Balkan countries to Europe (Moravcevic and Lakovic, 2015, p. 131).

Outlook

Montenegro's mineral industry is likely to continue its modest recovery. Aluminum and steel production in the country is expected to increase, albeit from a low base, under the new ownership of KAP and Tosçelik Niksic. Bauxite production may cease altogether if no bidders materialize for the assets of Rudnici Boksita. Coal production is expected to reverse its recent decline with the resumption of underground mining operations in Berane. Exploration for base metals in the country is contingent on the future progress of the Monty Project. Petroleum and natural gas exploration in Montenegro's Adriatic waters has the potential to transform the country into a producer of mineral fuels.

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TABLE 1
MONTENEGRO: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum, metal, ingot, primary		82,043	92,838	74,813	15,900	44,000 [e]
Bauxite		61,205	158,614	--	61,154	155,153
Iron and steel, crude steel		48,272	61,164	26,161 [r]	19,723 [r]	30,000 [e]
INDUSTRIAL MINERALS						
Gravel	cubic meters	49,517	47,717	48,374	78,374	59,783
Lime		839	3,448	--	--	--
Salt (seawater evaporate)		11,200	10,000	16,000	10,000	--
Sand		--	--	47,811	31,898	68,537
Stone, excluding quartz and quartzite, dimension, crude:						
Ornamental (marble blocks)	cubic meters	40,297	32,804	48,495	48,989	54,677
Crushed and broken	do.	55,383	69,141	62,922	135,178	221,584
Other, stone products	do.	39,921	35,487	61,959	53,289	68,537
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite		1,937,847	1,972,671	1,706,302	1,692,535	1,655,045

[e]Estimated. [r]Revised. do. Ditto. -- Zero.

[1] Table includes data available through September 28, 2015.

TABLE 2
MONTENEGRO: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina[1]	Kombinat Aluminijuma Podgorica (KAP) (Uniprom, 100%)	Podgorica	NA
Aluminum, primary	do.	do.	72
Bauxite	Rudnici Boksita (Government of Montenegro, 31.8%; Central European Aluminum Co., 31.8%; other investors, 36.4%)	Zagrad Mine in Niksic	700 [e]
Coal	Rudnik Uglja A.D. Pljevlja (A2A Group, 39.5%; Government of Montenegro, 31.1%; other investors, 29.4%)	Pljevlja	2,000 [e]
Do.	Metalfer Group	Berane	40
Steel, crude	Tosçelik Niksic A.D. (Tosyalı Group, 100%)	Niksic	150 [e]

[e]Estimated. Do., do. Ditto. NA Not available.

[1] No alumina was produced in Montenegro in 2014.

THE MINERAL INDUSTRY OF THE NETHERLANDS

By Alberto Alexander Perez

In 2014, the nominal gross domestic product (GDP) of the Netherlands was estimated to have increased by 0.8% to $696.3 billion (measured in terms of purchasing power parity), and the country was estimated to have had a 0.3% rate of inflation in the same year. The country accounted for 2.4% of the volume of world trade of goods and services, and it was a significant producer of crude oil and an important producer and distributor of natural gas in the European Union (EU) (CPB Netherlands Bureau for Economic Policy Analysis, 2015).

The Netherlands ranked 133d and 61st worldwide in terms of surface area and population size, respectively. In terms of economic performance in 2014, the Netherlands ranked as the 28th largest economy in the world and the 6th largest in the EU. The value of the Netherland's exports in 2014 was $552.8 billion, which made it the fifth-ranked exporter of goods in the world in terms of value. The Netherlands also was a significant importer of goods and services; in 2014, it imported $488 billion in goods, making it the seventh-ranked importer of goods in the world (Netherlands Enterprise Agency, 2015; U.S. Central Intelligence Agency, 2015).

Minerals in the National Economy

The Staatstoezicht op de Mijnen [State Supervision of Mines] is the agency within the Ministerie van Economische Zaken [Ministry of Economic Affairs] that oversees the production of minerals in the Netherlands and the Netherlands Continental Shelf. The agency is responsible for drafting and enforcing mining laws and mine safety and mineral production regulations.

The mineral sector was dominated by natural gas and petroleum production, and there were about 150 extraction locations in offshore fields. The Ministry of Economic Affairs supervised mineral resource extraction at about 600 mainland locations. In the nonfuel mineral sector, the Netherlands was engaged principally in downstream activities, including the chemical and metallurgical industries, which used mainly imported ores and industrial minerals. Mining was limited to the extraction of limestone, peat, and sand and gravel by quarrying and solution mining of salt in the eastern and northern areas of the country (table 1; Staatstoezicht op de Mijnen, 2016).

Production

In 2014, the principal mineral commodities produced in the Netherlands were cadmium, crude petroleum, crude steel, pig iron, and refined zinc (table 1). Rotterdam was an important shipping and storage center. In 2014, the throughput of imports and exports of the following mineral commodities were the most important in terms of total tonnage: crude petroleum, 95.4 million metric tons (Mt); mineral oil products, 75 Mt; iron ore and scrap, 34.1 Mt; and coal, 30.4 Mt (Port of Rotterdam Authority, 2015, p. 2).

Structure of the Mineral Industry

According to the Netherlands Foreign Investment Agency, the country was host to about 6,300 foreign companies, such as BASF S.E. and Siemens AG of Germany; Yakult Honsha Company Ltd. of Japan; Saudi Basic Industries Corp. (SABIC) of Saudi Arabia; and Cisco Systems Inc., Microsoft Corp., and Nike Inc. of the United States. Over time, foreign companies have made direct investments totaling $589 billion. Dutch-based multinationals, such as AkzoNobel NV, Heineken NV, ING NV, Koninklijke Philips N.V., KPN NV, Royal Dutch Shell plc, and Unilever NV also have made significant investments abroad. Mineral industry facilities in the Netherlands were mostly privately owned, although the Government continued to be involved in the energy sector through the regulation and oversight of petroleum and natural gas operations (Netherlands Enterprise Agency, 2015). Table 2 is a list of the major mineral industry facilities.

Commodity Review

Metals

Aluminum.—Klesch Aluminum Delfzijl BV (ALDEL) was scheduled to resume operations in March 2015 after being closed since December 2013 when it filed for bankruptcy at the court of Groningen. ALDEL stated that it had been struggling with increasing power prices and the differentials between the Netherlands and the surrounding countries. There was no primary aluminum production in the Netherlands in 2014 (Aluminum Delfzijl BV, 2013).

Iron and Steel.—Tata Steel Group (Tata) of India, which was the owner of Tata Steel Europe Ltd., stated in its annual report for 2013 that its Ijmuiden steel plant was going through a 5-year improvement program that was focused on enhancing production capacity, improving reliability, and reducing cost. Tata reported that at the end of the program, the total capacity of the plant would increase from 7.2 million metric tons per year (Mt/yr) of crude steel to 7.7 Mt/yr. Tata Steel Europe was part of the ultra-low carbon dioxide emission steelmaking (ULCOS) consortium, which is a consortium of 48 European companies and organizations that had developed a process to produce iron that reduces carbon dioxide emissions by eliminating the need to pelletize iron ore and to produce coke from coal (Tata Steel Group, 2014, p. 12, 23, 24).

Zinc.—Nyrstar NV's Budel plant increased its production to 290,000 metric tons in 2014, which, according to the company, set a new production record. The increased production was owing to scheduled continuing improvements to its electrolysis processes. Nyrstar indicated that the Budel plant would continue to update its installations and processes throughout 2014 and 2015 with the aim of being able to handle a wider range of concentrates and to increase production (Nyrstar NV, 2015a, p. 43; 2015b).

Mineral Fuels

Natural Gas.—The Dutch Minister of Economic Affairs stated in January that natural gas production at the Groningen field would be reduced during the next 3 years owing to the concern of local residents about vibrations that were attributed to the exploitation of the field. The Groningen field was a major asset for its operators—Exxon Mobil Corp. of the United States, Royal Dutch Shell, and the Dutch Government—owing to its flexible delivery profile and the important source of revenue it represents. The field was important also as it supplied natural gas to customers in northwestern Europe in the winter months. Natural gas output at the Groningen field was reduced to a maximum of 39.62 billion cubic meters in 2014 and would be reduced to 16.98 billion cubic meters in 2015. Groningen, which is located in the northeastern portion of the Netherlands, produced nearly 54 billion cubic meters of natural gas in 2013 (Platts, 2014).

Outlook

The Netherlands is expanding its infrastructure to increase the volume of its natural gas exports in the region. Renewable energy is being promoted by the Government as the Netherlands plan to meet European Commission targets by 2020. The Port of Rotterdam is expected to continue to be a major port in Europe, particularly for container traffic, and it is expected to continue to play a significant role in European trade.

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TABLE 1
NETHERLANDS: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, metal, primary		300,000	300,000	110,000	50,000	--
Cadmium, metal, primary		560	570	560	560	570
Iron and steel:						
Pig iron, including blast-furnace ferroalloys (if any)		5,799,000	5,943,000	5,909,000	5,686,000	5,868,000
Steel:						
Crude		6,651,000	6,937,000	6,867,000	6,714,000	6,964,000
Semimanufactures		6,523,000	6,765,000	6,739,000	6,580,000	6,700,000 [e]
Lead, metal, refined, secondary[e]		27,000 [r]	27,000 [r]	27,000 [r]	27,000 [r]	27,000
Zinc, metal, primary		254,000	261,000	257,000	275,000	290,000
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	2,138	2,318	2,500	2,500	2,600
MINERAL FUELS AND RELATED MATERIALS						
Gas, dry natural:						
Gross	million cubic meters	88,668	80,731	80,787	86,422 [r]	86,400 [e]
Marketed	do.	88,660	80,731	80,787	86,422 [r]	86,400 [e]
Petroleum:						
Crude	thousand 42-gallon barrels	7,300	8,121	8,212	7,556 [r]	7,738
Refinery products:						
Liquefied petroleum gas	do.	16,534	16,500	17,958	17,484 [r]	17,500 [e]
Gasoline, motor	do.	63,145	63,000	59,495	53,765 [r]	53,800 [e]
Naphtha and white spirit[e]	do.	90,000	--	--	--	--
Kerosene and jet fuel	do.	51,794	51,700	55,991	53,801 [r]	53,800 [e]
Refinery fuel and loss[e]	do.	30,000	--	--	--	--
Diesel oil	do.	159,031	159,000	151,511	150,599 [r]	151,000 [e]
Residual fuel oil	do.	63,218	63,000	55,918	54,385 [r]	54,500 [e]
Unspecified	do.	101,653	100,000	104,755	102,612 [r]	102,000 [e]
Total	do.	575,375	453,000	445,628	432,646 [r]	432,000 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through June 5, 2015.

[2] In addition to the commodities listed, the Netherlands produced magnesium compounds, nitrogen, salt, sodium compounds, sulfur (as an elemental byproduct of metallurgy and of petroleum and natural gas), and construction materials, such as limestone, peat, and sand and gravel, but available information was not sufficient to make reliable estimates of output.

TABLE 2
NETHERLANDS: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum:				
Primary		Klesch Aluminum Delfzijl BV[1] (ALDEL) (Klesch and Co. Ltd., 100%)	Smelter at Delfzijl	165
Secondary		Alumax Recycling BV	Smelter at Kerkade	50
Do.		Zeeland Aluminium Co. BV (ZALCO) (UTB Holding B.V. 100%)	Plant at Flushing (Vlissingen)	230
Cadmium	metric tons	Nyrstar NV	Plant at Budel	650
Calcium carbonate, ground		Omya Netherlands BV	Plant at Moerdijk	500
Cement		Eerste Nederlandse Cement Industrie NV (HeidelbergCement Group, 100%)	Plants at IJmuiden, Maastricht, and Rotterdam	3,700
Do.		Cementfabriek IJmuiden BV	Three plants at IJmuiden	1,600
Do.		Cementfabriek Rozenburg BV	Two plants at Rozenburg	920
Limestone		Ankerpoort NV (Lhoist SA, 100%)	Mines at Maastricht and Winterswijk	600
Magnesia		Nedmag Industries Mining & Manufacturing BV	Plant at Veendam	130
Do.		MAF Magnesite BV	Plant at Schiedam	40
Natural gas	million cubic meters	Nederlandse Aardolie Maatschappij BV (NAM) (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc., 50%)	Groningen, Leeuwarden, Assen, and other onshore gasfields and several offshore wells in the North Sea	225
Petroleum:				
Crude	42-gallon barrels per day	BP p.l.c., ConocoPhillips Co., and Chevron Corp.	766 wells (204 producing), including the following North Sea fields: Haven, Helder, Helm, Hoorn, Kotter, Logger, and Rijn	83,500
Do.	do.	Nederlandse Aardolie Maatschappij BV (NAM) (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Onshore fields: Berkel, DeLier, Ijselmonde, Meerkapelle, Pernis, Pinacke, Rotterdam, Schoonebeck, West, Werkendam, and Zoetemeer	20,500
Do.	do.	Veba Oil and Gas Netherlands BV	Hanze field, North Sea	31,500
Refinery		Several companies, of which the four major ones are:	Refineries, including:	1,230,500
Do.		Netherlands Refining Co. (BP p.l.c., 69%, and Chevron Corp., 31%)	Rotterdam	(446,000)
Do.		Shell Nederland Raffinaderij BV	Pernis	(374,000)
Do.		Esso Nederland BV	Rotterdam	(175,000)
Do.		Zeeland Refinery NV (Total Nederland NV, 55%, and LUKOIL 45%)	Vlissingen	(150,000)
Salt		Akzo Nobel Salt BV (Akzo Nobel NV, 100%)	Mines, of which:	4,100
Do.		do.	Hengelo	(2,100)
Do.		do.	Delfzijl	(2,000)
Sand, silica		Sigrano Nederland NV (Sibelco Group)	Mines and plants at Heerlin and Maastricht	500
Do.		Lieben Minerals BV	Mines at South Limburg	150
Sodium:				
Carbonate, synthetic		Brunner Mond Group BV	Plant at Delfzijl	380
Sulfate, synthetic		do.	do.	600
Steel		Tata Steel Europe Ltd. (Tata Steel Group)	Plant at Ijmuiden	7,200
Zinc		Nyrstar NV	Plant at Budel	290

Do., do. Ditto.

[1] Klesch Aluminum Delfzijl BV filed for bankruptcy on December 30, 2013, and remained closed until March 2015, when it officially reopened.

THE MINERAL INDUSTRY OF NORWAY

By Alberto Alexander Perez

Norway is a northern European country, which, while not a member of the European Union (EU), participated in the EU's euro area single market through the European Economic Area. Mineral trade was important to the economy in 2014, and, in terms of the export value, petroleum was Norway's most valuable mineral commodity. In 2014, Norway was the 15th-ranked crude petroleum producer in the world and, in terms of the volume of output, the leading crude petroleum producer in Europe. Norway's production of ilmenite accounted for about 8% of world production (U.S. Energy Information Administration, 2015b; Bedinger, 2016).

Norway relied heavily on its production and export of hydrocarbons to finance its economy; nonetheless, despite the volatility in crude oil prices in 2014, the country's real gross domestic product increased to $499.8 billion[1] in 2014 from $487 billion in 2013. The principal mineral commodities produced in Norway were coal, iron ore, natural gas, nickel, petroleum, sand and gravel, stone, and titanium. Mines and quarries were mostly of regional significance and were located mainly along the coast. The natural gas and petroleum fields were located mainly offshore in the Norwegian area of the North Sea (table 1; U.S Energy Information Administration, 2014; Statistics Norway, 2015).

Minerals in the National Economy

In 2014, the natural gas and crude petroleum sector accounted for the largest portion of the country's exports and, in anticipation of the eventual decrease in natural gas and petroleum production, the Government was saving a significant amount of revenue from petroleum exports in a sovereign wealth fund (SWF), which was valued at more than $870 billion. Norway's SWF was the second largest of all the SWFs after Luxembourg. Several United States companies had invested in and were part of Norway's petroleum sector, and several Norwegian companies participated in the petroleum sector of the United States. United States trade in goods with Norway in 2013 (the latest year for which information was available) totaled $4.488 billion in exports and $5.488 billion in imports, for a negative trade balance of about $1 billion. United States mineral exports to Norway included petroleum products, drilling and oilfield equipment, coal and other fuels, fuel oil, and finished metal shapes. Norway's mineral exports to the United States included petroleum products, crude petroleum, fuel oil, liquefied petroleum gases, and nickel (U.S. Census Bureau, 2014a, b; Statistics Norway, 2015; U.S. Central Intelligence Agency, 2015).

Production

Norway's production of graphite increased by 33.8% in 2014. Other significant increases in mineral production included quartz and quartzite (increased by 24.5%), zinc metal (15.4%), iron ore (13%), primary aluminum (8.2%), dolomite (8%), ilmenite (4.6%), and copper metal (4.1%). The production of olivine sand decreased by 18%. Other significant decreases in mineral production included that of coal (by 8.3%) and cadmium metal (6.5%) (table 1).

Structure of the Mineral Industry

Norway's mineral industry was composed of a mixture of Government and privately owned operations. Table 2 lists the major mineral companies that were operating in Norway in 2014 and their respective mine and (or) plant locations and capacities.

Commodity Review

Metals

Cobalt, Copper, and Platinum-Group Metals.—Nordic Mining ASA's exploration efforts in northern Norway were concentrated in the Lokkarfjord and the Reinfjord areas of the Øksfjord Peninsula, and the deposits in these areas were reported to contain cobalt, copper, gold, and platinum-group-element mineralization. The Øksfjord Peninsula is part of the Seiland Igneous Province (SIP). The SIP shares many characteristics with other geologic provinces that host deposits of copper, nickel, and platinum-group elements, such as the Bushveld Complex in South Africa, the Stillwater Complex in Montana, and the Fennoscandian Suhanko and Penikat intrusions in Finland. The SIP had not been significantly explored for minerals of commercial value (Nordic Mining ASA, 2014c).

Titanium.—In 2014, Nordic Mining continued with its proposed rutile mine development project at Engebøfjellet. The mining operation would be developed in two stages: first, with an open pit operation, which would be active for a period of 10 to 15 years, and next, as an underground operation with a mine life of about 35 years. The 2.5-kilometer (km)-long rutile-bearing eclogite body was reported to contain a mineral resource of 154 million metric tons (Mt) of eclogite at an average grade of 3.8% rutile. The rutile is disseminated in the eclogite. The Engebøfjellet eclogite deposit is practically free of the radioactive elements thorium and uranium. Nordic Mining reported that it was expecting to produce 100,000 metric tons per year (t/yr) of rutile concentrate and 100,000 t/yr of garnet concentrate following a 2015 startup of the mine (Nordic Mining ASA, 2014a).

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[1] Where necessary, values have been converted from Norwegian kroner (NOK) to U.S. dollars (US$) at an annual average exchange rate of NOK 6.3051=US$1.00. All values are nominal, at current prices, unless otherwise stated.

Industrial Minerals

Norway was a significant regional producer of industrial minerals. Production of aggregate, gravel, and sand for domestic use and export was a significant contributor to the national economy.

Quartz and Quartzite.—Nordic Mining planned to produce high-quality quartz at its Nesodden deposit near Kvinnherad in western Norway. The deposit had been estimated to have mineral resources of 3 Mt of crystalline hydrothermal quartz on a 12.6-km-long vein that reached a depth of 150 meters (m). The quartz vein is situated in Proterozoic rocks south of the Hardanger fault zone (HFZ). The HFZ is a 600-km-long Caledonian ductile shear zone. The quartz vein is about 600 m long and about 15 m wide with a depth of 150 m (Nordic Mining ASA, 2014b).

Mineral Fuels and Other Sources of Energy

Norway was characterized by an abundance of two forms of energy: hydroelectric power and mineral fuel resources. The bulk of domestic demand for energy was fulfilled with hydroelectric power; mineral fuels were produced mainly for export. Norway had a highly developed natural gas and petroleum sector and was the leading petroleum producer and exporter in Western Europe.

Coal.—Store Norske Spitsbergen Grubekompani AS (SNSG), which was wholly owned by Store Norske Spitsbergen Kulkompani AS, continued to be Norway's sole coal producer. The company's two mines, the Gruve 7 Mine and the Svea Nord Mine, were located on the Arctic archipelago of Svalbard, which is situated about midway between mainland Norway and the North Pole. In 2013 (the latest year for which data were available), the Gruve 7 Mine produced 64,687 metric tons (t) of salable coal, and the Svea Nord Mine produced 1,778,325 t. Development work at a new mine, the Lunckefjell Mine, started in December 2013, and 11,871 t of salable coal was produced. Norway continued to be a net exporter of coal; more than 50% of Norway's coal production was exported to Germany (Store Norske Spitsbergen Kulkompani AS, 2014, p. 8–10).

Petroleum.—Norway, which has the largest petroleum reserves in Europe, was reported to have 5.8 billion barrels of proven reserves in 2014. All the reserves were located offshore on the Norwegian Continental Shelf, which is divided into three sections: the Barents Sea, the North Sea, and the Norwegian Sea. The bulk of production had taken place in the North Sea, and smaller amounts had been produced in the Barents Sea and the Norwegian Sea. According to the U.S. Energy Information Administration, new exploration and production activity was taking place in the Norwegian Sea and the Barents Sea (U.S. Energy Information Administration, 2014; 2015a).

Renewable Energy.—Energi Norge [Energy Norway] is a nonprofit industry organization that is composed of 270 companies that produce, distribute, and trade electricity in Norway. Combined, Energy Norway's members produce nearly 130 terawatthours each year, which is 99% of all power production in Norway. The majority of the electricity is generated using hydropower and renewable energy sources, such as wind power and biomass. According to Energy Norway, Norway has only 1% of Europe's population but 20% of the hydropower resources, 40% of the gas resources, and 60% of the oil resources of the continent. Energy Norway members also have approximately 2.5 million grid customers, which is about 91% of Norway`s grid customers. The members of Energy Norway have about 15,000 employees (Energi Norge, 2014).

Outlook

Despite the volatility in international prices of crude petroleum, Norway is expected to continue to rely heavily on its petroleum exports to keep its economy growing. It is likely that Norway will increase its investment in and development of the natural gas industry to increase its production and exports, which could compensate for decreasing revenues from lower crude oil prices. The Norwegian Petroleum Directorate is expected to continue with efforts to open up new offshore areas, particularly in the Arctic region. Industrial minerals are expected to continue to be important to the nation's domestic economy.

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TABLE 1
NORWAY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Primary	metric tons	1,298,000	1,389,000	1,145,000	1,154,900 [r]	1,250,000 [e]
Secondary[e]	do.	300,000	300,000	250,000	250,000	250,000
Cadmium, metal	do.	300	309	310	310 [r]	290 [e]
Cobalt, metal, refined	do.	3,208	3,067	2,969	3,348 [r]	3,500 [e]
Copper, metal, refined, primary and secondary	do.	32,000 [e]	32,000 [e]	36,000	37,461 [r]	39,000 [e]
Iron and steel:						
Iron ore and concentrate, Fe content		3,105	2,532	3,421	3,409 [r]	3,854
Metal:						
Ferroalloys:						
Ferromanganese		297	338	326	320	320
Ferrosilicomanganese		249	266	271	270	270
Ferrosilicon, 75% basis[e]		230	230	250	285	285
Silicon, metal[e]		175	175	150	180 [r]	180
Steel, crude		514	620	600	605 [r]	595
Mercury[e]	metric tons	25	25	25	25	25
Nickel:						
Mine output, concentrate, Ni content	do.	351	339	351 [2]	350	350 [e]
Metal, primary	do.	92,100	92,427	91,687	91,017 [r]	92,000
Titanium:						
Ilmenite concentrate		864	870	831	826 [r]	864
TiO_2 content		371	400 [e]	400	400	400 [e]
Zinc, metal, primary	metric tons	147,775	153,200	152,647	143,000	165,000
INDUSTRIAL MINERALS						
Cement, hydraulic[e]		1,298	1,387	1,500	1,700 [r, 2]	1,700 [2]
Clays		230 [e]	230 [e]	225	225	225
Feldspar		56	25	--	--	154
Graphite, flake	metric tons	6,270	7,789	6,992	6,207 [r]	8,308
Lime, hydrated, quicklime[e]		100	100	125	125	125
Nepheline syenite		327	330	320	320 [r]	331
Nitrogen, N content of ammonia		300	300	300	300	300
Olivine sand		2,560	2,237	1,650	1,702 [r]	1,394
Sand and gravel		13,011	13,215	14,260 [r]	13,984 [r]	14,110
Stone, crushed:						
Dolomite		604	682	643	661 [r]	714
Limestone		6,129	5,956	5,856	5,703 [r]	5,839
Quartz and quartzite		1,055	1,162 [e]	1,083	1,451 [r]	1,095
Sulfur, byproduct:[e]						
Metallurgical		80	90	90	90	90
Petroleum		20	19	20	20	20
Total		100	109	110	110	110
Talc, soapstone, steatite	metric tons	6,400	8,191	7,983	-- [r]	--
MINERAL FUELS AND RELATED MATERIALS						
Coal, all grades		1,685	1,640	1,583	1,855 [r]	1,701
Gas, natural, marketed	million cubic meters	105,280	101,376	106,710	113,116 [r]	112,796
Peat, for agricultural use[e]	do.	490	500	500	500	500
Petroleum:						
Crude	thousand 42-gallon barrels	777,450	732,555	694,230	558,450 [r]	572,320
Refinery products:						
Gasoline	do.	28,142	32,303	30,920	32,850 [r]	32,800 [e]
Jet fuel	do.	3,942	4,380	4,636	3,650 [r]	3,600 [e]
Kerosene	do.	1,971	511	1,351	2,555 [r]	2,550 [e]
Distillate fuel oil	do.	43,545	49,567	46,866	51,100 [r]	51,100 [e]
Residual fuel oil	do.	12,301	11,425	10,366	10,950 [r]	11,000 [e]
Other products	do.	17,776	17,447	20,805	21,170 [r]	21,200 [e]
Total[e]	do.	107,700	115,600	114,900	122,275 [r]	122,250 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through August 17, 2015.

[2] Reported figure.

TABLE 2
NORWAY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Hydro Aluminium ANS (Norsk Hydro ASA, 70%)	Smelters at Ardal, Hoyanger, Karmoy, Sunndal, and Husnes	1,020
Do.		do.	Rolling mill at Holmestrand	90
Do.		Alcoa Inc.	Smelters at Lista and Mosjoen	282
Cadmium	metric tons	Boliden Odda A/S (Boliden AB, 100%)	Smelter at Eitrheimsneset	0.3
Cement		Norcem A/S (HeidelbergCement Group)	Plants at Brevik and Kjopsvik	1,700
Coal		Store Norske Spitsbergen Grubekompani A/S	Mines at Longyearbyen and Svea	2,000
Cobalt, metal		Nikkelverk A/S (Glencore plc, 100%)	Refinery at Kristiansand	3
Copper, metal		do.	do.	40
Dolomite		Franzefoss MiljokalkA/S	Mine at Ballangen	350
Do.		Omya Hustadmarmor A/S	Mines at Hammerfall and Seljeli	900
Ferroalloys		Elkem Bjolvefossen (China Bluestar)	Ferrosilicon plant at Alvik	NA
Do.		Elkem Bremanger (China Bluestar)	Ferrosilicon plant at Svelgen	NA
Do.		Finnfjord Smelteverk A/S	Ferrosilicon plant at Finnsnes	100
Do.		FESIL Rana Metall ASA (MFC Group)	Ferrosilicon plant at Mo i Rana	90
Do.		Hafsil AS	Ferrosilicon powder plant at Sarpsborg	5
Do.		Eramet Norway AS	Ferromanganese plant at Porsgrunn	115
Do.		do.	Ferromanganese plant at Sauda	170
Do.		Glencore Manganese (Glencore plc., 100%)	Ferromanganese plant at Mo i Rana	120
Graphite, flake		Skaland Graphite AS (LNS Group)	Traelen Mine and plant at Skaland	9
Iron, metal		Ulstein Jernstoperi A/S (Bergen Engines A/S)	Hordvikneset	10
Do.		TiZir Ltd. (Eramet Group, 50%)	Tyssedal (pig iron)	110
Iron ore		Rana Gruber A/S (LNS Group)	Mine at Mo i Rana	4,600
Do.		Northern Iron Ltd.	Mine at Bjørnevatn	6,000
Lime		Hylla Kalkverk (Franzefoss Minerals, 100%)	Verdal plant	200
Limestone		Norcem A/S (HeidelbergCement Group)	Dalen, Bjorntvedt, and Kjopsvik Mines	1,600
Do.		Bronnoy Kalk	Akselberg Mine	2,200
Do.		Vardelskalk A/S (Franzefoss Burk A/S, 100%)	Sandvika Mine	800
Do.		Visnes Kalk AS	Lyngstad quarry	600
Do.		Franzefoss Minerals	Hamar and Hole quarries	50
Manganese, alloys		Eramet Norway AS	Silicomanganese plant at Kvinesdal	160
Do.		do.	Silicomanganese plant at Porsgrunn	65
Natural gas	million cubic meters	Statoil ASA	Grane, Gullfaks, Sleipner Ost, and Statfjord fields	12,270
Do.	do.	ConocoPhillips Skandinavia A/S (operator)	Ekofisk field	9,900
Do.	do.	Elf Petroleum Norge A/S	Frigg, Heimdal, and Ost-Frigg fields	5,750
Do.	do.	Statoil ASA	Mikkel field	2,100
Do.	do.	Total S.A., 40%; Petoro, 30%; Marathon Petroleum Norge AS, 20%	Skirne field	1,550
Do.	do.	Esso Norge A/S	Odin field	1,000
Do.	do.	Amoco Norway A/S	Hod and Valhallfields	910
Nepheline syenite		Sibelco Nordic	Mine at Stjernoy	350
Nickel:				
Ore, concentrate, Ni content		Titania A/S (Kronos Norge A/S, 100%)	Mine at Tellnes	0.35
Metal		Nikkelverk A/S (Glencore plc., 100%)	Refinery at Kristiansand	85
Olivine		Sibelco Nordic AS	Mines and plant at Aheim	2,000
Petroleum	42 gallon barrels per day	BP Petroleum Development of Norway	Ulaf fields	155,000
Do.	do.	A/S Norske Shell	Draugen field	90,000
Do.	do.	Esso Norge A/S (Exxon Mobil Corp., 100%)	Slagen Refinery at Slagentangen	11,000
Do.	do.	Statoil Mongstad A/S (Statoil ASA, 100%)	Mongstad Refinery	84,000
Quartzite		Elkem Tana (China Bluestar)	Mine at Tana	1,200
Do.		Elkem Marnes (China Bluestar)	Mine at Marnes	200
Do.		Georg Tveit A/S (Eramet Norway AS, 75%)	Mine at Kragero	110
Silicon, metal		Elkem Salten (China Bluestar)	Silicon plant at Straumen	70
Do.		Elkem Thamshavn (China Bluestar)	Silicon plant at Orkanger	45
Do.		Holla Metall (Wacker Chemicals Norway A/S)	Plant at Holla	50
Steel		Celsa Armeringsstal	Plant at Mo i Rana	600
Titanium minerals, concentrate		Titania A/S (Kronos Norge A/S, 100%)	Mine at Tellnes	915
Zinc, metal		Boliden Odda A/S (Boliden AB, 100%)	Smelter at Odda	200

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF POLAND

By Alberto Alexander Perez

In 2014, the gross domestic product (GDP) of Poland amounted to $544.863 billion,[1] which was an increase of 3.8% compared with that of 2013. In 2014, Poland was the 8th most populated country in Europe and the 34th most populated in the world. The country had an annual average total unemployment rate of 9%. The annual long-term unemployment rate was 3.8%. Poland's foreign direct investment, as a percentage of its GDP at current prices, amounted to 0.7%. The debt of the public sector was 50.4% of the GDP, and the deficit in Government expenditures was 3.3% of the GDP. Its GDP was produced by the services sector (64.6%); the industrial and construction sectors (32.5%); and the agricultural, fishing, and forestry sectors (2.9%).

In 2014, Poland was estimated to be the world's 3d-ranked producer of rhenium, the 8th-ranked producer of silver, and the 11th-ranked producer of cadmium and mined copper. Industrial minerals, such as feldspar, gypsum, lime, salt, sand and gravel, and sulfur, were also produced in significant quantities. Poland was estimated to be the world's 10th-ranked producer of bituminous coal in 2014 and the 2d-ranked producer in Europe; however, it was dependent on imports to meet domestic demand for natural gas and crude oil (Central Statistical Office of Poland, 2015, p. 692, 754–756, 759; Apodaca, 2016; Bolen, 2016; Brininstool, 2016; Crangle, 2016; George, 2016; Polyak, 2016; Tanner, 2016; Tolcin, 2016).

Minerals in the National Economy

In 2014, Poland had a total of 4,661 companies in the mining and quarrying sector and 479,680 in the construction sector. Of all sold production in the industrial sector in 2014, mining and quarrying accounted for 4.1% and the manufacture of basic metals accounted for 3.6%. Metal products accounted for 7% of all sold production in the industrial sector; manufactured coke and refined petroleum products, 6.4; and manufactured other nonmetallic mineral products, 3.7%. The mining and quarrying industry employed about 159,500 people, and the entire manufacturing sector employed about 2,248,800 people (Central Statistical Office of Poland, 2015, p. 506–507, 509, 694, 731).

Government Policies and Programs

The Polish Geological and Mining Law (GML) of June 9, 2011, which included particular regulations on hydrocarbons, became effective on January 1, 2012. In March 2013, a draft proposal to amend the GML was published by Poland's Ministry of Environment, which sought to add some new features related to licensing, the environment, effects on communities, taxation, and the National Energy Minerals Operator Fund (a national fund for environmental protection and water management). It proposed new taxes based on the value of the extracted raw materials for gas, oil, and other hydrocarbons, and a limit on the extraction tax equal to 40% of the company's gross profit (Rutkowska-Subocz, 2012; Library of Congress, 2013).

Poland's Ministry of Finance started collecting new taxes on the extraction of copper and silver on April 18, 2012, through the Act of March 2, 2012. The new tax targeted the country's sole copper and silver producer, KGHM Polska Miedz S.A. (KGHM). In March 2013, the Ministry of Finance completed a draft hydrocarbon taxation proposal, which called for a tax rate of 39% for shale deposits and 41.92% for conventional deposits (Library of Congress, 2013; Ministry of Finance of the Republic of Poland, 2013).

In March 2012, the Government announced its new Privatization Plan for 2012–2013. The primary purpose of the plan was to present the main objectives of the privatization policy and to list the affected companies. The plan included leading mining and energy companies. Implementation of the plan was reported to be on schedule as of September 2013 (Ministry of Treasury of the Republic of Poland, 2015, p. 14, 16).

Production

In 2014, gold metal production increased by 142%, and the lead content of copper ore increased by 61%. Other significant increases in production included that of primary cadmium metal, which increased by 37%; lead content of lead-zinc ore, 36%; pig iron, 16%; silver content of copper concentrate, 15%; and zinc (metal, refined), primary and secondary, 6%. In industrial mineral production, anhydrite gypsum production increased by 11%, and cement clinker, by 9%. Significant production decreases in the metals sector included production of zinc (mine output), which decreased by 23%; secondary aluminum metal, by 7%; and rhenium content of ammonium perrhenate, 6%. Significant production decreases in the industrial minerals sector included that of rock salt, which decreased by 41%; dolomite, 30%; crude fire clay, 16%; evaporated salt, 6%; and gypsum rock, 5%. Significant decreases in the mineral fuels sector included the production of peat (both fuel and agricultural), which decreased by 25%; and bituminous coal, by 5%. Data on mineral production are in table 1.

Structure of the Mineral Industry

The majority of companies in the mineral industry in Poland were privately owned; however, the Polish Government (through ownership of shares by the Polish Ministry of Treasury) owned shares in a small number of producers of mineral products. The Ministry of Treasury's priorities in the management of its portfolio, including a plan active until 2015, listed 53 companies. Besides these companies, another 190 enterprises that may be subject to ownership transformations were included in the Government's priority plan. The strategically important companies included energy production companies ENEA S.A., ENERGA S.A., PGE Polska Groupa Energetyczna S.A., Zespol Elektrowni "Patnow-Adamow-Konin" S.A., and Zespol Elektrowni Wodnych Niedzica S.A.; and mining companies Jastrzebska Spolka Weglowa S.A., Katowicki Holding Weglowy S.A., Kompania Weglowa S.A., Kopalnia Wegla Brunatnego "Adamow" S.A., Kopalnia Wegla Brunatnego "Konin" w Kleczewie S.A., and Lubelski Wegiel Bogdanka S.A. (Ministry of Treasury of the Republic of Poland, 2015, appendixes 1–3).

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[1] Where necessary, values have been converted from Polish zlotys (PLN) to U.S. dollars (US$) at an average rate of PLN3.1551=US$1.00 for 2014.

As of 2014, the Government's most important holdings in the mineral sector included a 31.79% stake in KGHM (copper, silver, and other metals), a 53.20% stake in Grupa LOTOS S.A. (oil and gas), a 72.41% stake in PGNiG S.A. (oil and gas), a 27.52% stake in PKN Orlen S.A. (refinery), a 55% stake in Jastrzebska Spolka Weglowa S.A. (bituminous coal), and a 61.88% stake in PGE Polish Energy Group plc. (bituminous coal and lignite). Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2013 (the latest year for which data were available), the value of the country's exports amounted to $206 billion, and the value of imports was $208 billion. The leading export mineral commodity, by value, was copper and copper alloys at about $2.56 billion, followed by silver at about $894 million. The country's major export trade partners for copper and copper alloys were Germany (42%), China (27%), France (9%), and Italy (8%). The leading import commodity, by value, was crude petroleum and natural gas condensate (about $18.0 billion), followed by natural gas at $1.5 billion, and iron ore and concentrates (including roasted iron pyrite) at $689 million. Russia supplied 94% of Poland's crude petroleum imports (Central Statistical Office of Poland, 2014).

Commodity Review

Metals

Copper and Silver.—In 2014, Poland had 14 copper-silver deposits with total estimated resources of 1,736 million metric tons (Mt) containing 33.22 Mt of copper and 102,110 metric tons (t) of silver. Of these deposits, six were operating mines from which the total estimated resources were 1,421 Mt containing 27.81 Mt of copper and 82,950 t of silver. Six deposits were in the exploration stage, and they had estimated resources of 292 Mt containing 5.16 Mt of copper and 18,070 t of silver. Two abandoned deposits had estimated resources of 24 Mt containing 0.26 Mt of copper and 1,080 t of silver (Polish Geological Institute, 2015c).

KGHM was Poland's only producer of mined copper and primary copper metal, and it operated three mines (the Lubin, the Polkowice-Sieroszowice, and the Rudna Mines) and three copper refineries (Glogow I, Glogow II, and Legnica) (KGHM Polska Miedz S.A., 2015, p. 24).

In 2014, the company produced about 33 Mt of copper ore, with an average copper content of 1.53%, which was lower than the average of 1.57% in 2013 and was owing to a decrease in the content of the copper in the deposit. The copper content of the extracted ore was 473,000 t compared with 482,000 t in 2013; KGHM's leading foreign customers were China, the Czech Republic, France, and Germany (KGHM Polska Miedz S.A., 2015, p. 39, 41).

Gold.—In 2014, all gold was extracted from copper-silver deposits in the area of the Fore-Sudetic monocline in southwestern Poland, and all gold production was entirely a byproduct of copper mining. The anode slime, which was produced by the copper electro-refining process that takes place at all three smelters, contained precious metals. This anode slime was the principal material in the production of gold, as well as other mineral commodities. In 2014, Poland produced 226.1 kilograms (kg) of gold recovered from domestic sulfide copper-mercury ores.

KGHM produced 2,574 kg of gold, which was a 142% increase compared with that of 2013. This increase in the company's production of gold metal was owing to the increase in the production of gold concentrate at KGHM's mining facilities outside of Poland, as well as the processing of imported concentrates not produced at KGHM's mines, This enabled the company to increase its gold revenues by 127% (KGHM Polska Miedz S.A., 2015, p. 24, 42; Polish Geological Institute, 2015b).

Iron and Steel.—In 2014, steel production amounted to about 8.6 Mt, of which 59% was produced by the basic oxygen furnace (BOF) process and 41% was produced by the electric arc furnace process (table 1).

ArcelorMittal Poland S.A. was the leading steel producer in Poland, representing about 70% of the country's steel production capacity. Approximately 50% of raw steel in the country was produced at ArcelorMittal's plants at Dabrowa Gornicza and Krakow using the BOF process (Burkowicz and others, 2013, p. 282).

Cognor S.A. held a 100% interest in Ferrostal Labedy Sp. z o.o. and Huta Stali Jakosciowych S.A., which had a combined crude steel production capacity of 636,000 t. In 2014 the company produced 582,549 t of crude steel, which represented a 91.6% capacity utilization rate and a 15% increase compared with the 505,966 t produced in 2013. The company accounted for 6.8% (about 8.6 Mt) of Poland's steel production in 2014. Cognor produced 176,094 t of high-grade alloy steel in 2014, which was 35.5% of Poland's market share, and 188,053 t of billets, or about a 20% share of the Polish billet sales market (Cognor S.A., 2015, p. 13).

Molybdenum and Tungsten.—Molybdenum, tungsten, and copper were produced from the Myszkow deposit located at the northeastern margin of the Upper Silesian coal basin; the deposit is in the contact zone of the Malopolska Block and Upper Silesian Block, which are separated by the Hamburg-Krakow tectonic zone. This deposit is of the molybdenum-tungsten-copper porphyry type. Its ore mineralization is of the stockwork type, forming a system of quartz veins with sulfide and oxide ore minerals related to Variscan igneous rocks. The resources of the Myszkow deposit down to a depth of 1,000 meters are estimated to exceed 550 Mt (Polish Geological Institute, 2015e).

Rhenium.—In 2014, Poland produced 7.71 t of rhenium, which was an increase from that of the previous year.

Rhenium is an important additive in superalloys used in the production of jet engines and catalysts. KGHM Ecoren S.A. (Ecoren) was the only European producer of ammonium perrhenate (APR) and metallic rhenium from its own sources, with an average rhenium content of 0.6 part per million (ppm) and a range of 0.4 to 1.1 ppm in the copper ore from the Fore-Sudetic monocline deposits. The company had the capacity to produce 3.5 metric tons per year of rhenium pellets, and it was capable of producing marketable quantities of pellets containing 99.95% rhenium. Ecoren was the world's third-ranked producer of rhenium contained in APR, accounting for 16% of total world production (Burkowicz and others, 2013, p. 419–420; Polyak, 2016).

Industrial Minerals

Gypsum.—In 2014, Poland's production of gypsum and anhydrite decreased by 3% to 1.06 Mt; it included 904,990 t of gypsum from three deposits and 147,480 t of anhydrite, also from three deposits. Poland had 15 deposits of gypsum and anhydrite with total estimated resources of 260 Mt; 5 of these deposits (accounting for a total of 128 Mt of estimated resources) were being mined. Detailed exploration had been conducted on another five of these deposits, resulting in a combined estimated resource of 95 Mt, and preliminary exploration had been conducted on another two of these deposits, resulting in a combined estimated resource of 33 Mt. The remaining three deposits had been abandoned; they had a total estimated resource of 3.57 Mt (Polish Geological Institute, 2015b).

Mineral Fuels

Coal.—In 2014, Poland's estimated resources of bituminous coal were about 52.0 billion metric tons (Gt), and all the country's operating coal mines were situated in the Upper Silesian coal basin except the large Bogdanka Mine. Total resources at the deposits that were being exploited amounted to 19.9 Gt in 2014 and accounted for 38.2% of total estimated resources. A new deposit was discovered in the Nowa Ruda field in the Piast-Waclaw-Lech region and four new deposits were discovered in the Upper Silesian coal basin and designated as Barbara-Chorzów 2, Brzezinka 3, Bzie-Dębina 2, and Jan Kanty 2, adding about 723 Mt of estimated resources (Polish Geological Institute, 2015d).

Estimated resources of brown coal (subbituminous) amounted to about 23.5 Gt in 2014. Nine deposits were being mined and the estimated resources of these deposits amounted to 1.48 Gt. Also, 73 unexploited deposits had total estimated resources of 22.0 Gt and 8 abandoned deposits had an estimated total of 16 Mt of resources. Production of brown coal amounted to about 63.877 Mt in 2014, which was a decrease of 3.23% compared with that of 2013. The leading producing mines (located in the Belchatow field) were the Belchatow Mine, which produced 26.64 Mt, or a 41.6 % of the country's brown coal production in 2014, and the Szczerców Mine, which produced 15.76 Mt, or 24.5% of the country's brown coal production in 2014 (Polish Geological Institute, 2015a).

Kompania Węglowa S.A. (KW) was the leading bituminous coal producer in Poland and in the European Union. It operated mines in Malopolskie Province and Silesia Province. The company had estimated resources of about 7.8 Gt and operating resources of about 1.6 Gt. The 14 coal mines operated by KW had a total mining capacity of 34 million metric tons per year. KW planned to decrease the number of its mines to 8 from 14 by 2020, and to reduce its production from about 38 to 40 Mt in 2012 to about 25 Mt in 2020. One reason for the high cost of mining was that the coal seams were too deep to be mined cost effectively (Kompania Węglowa S.A., 2014; Vorutnikov, 2014).

Outlook

The economy of Poland continued its growth trend, and its domestic consumption increased as well. This continuing recovery could possibly lead to a demand-driven increase in mineral commodity production, as long as the international commodity prices are sufficiently high to support this production. Much of the growth will depend on the demand for Polish products by its main trade partners, in particular those in the EU. Because coal and copper are two of the most significant mineral commodities that Poland produces, they are expected to remain the leading mineral products in terms of production and trade value. Poland will likely continue to depend on imports of mineral fuels, and this dependence will remain one of Poland's biggest challenges in the long term as coal production will gradually decline because of tightening environmental regulations. The Government's privatization efforts are continuing and, thus, the Government's ownership of mineral-producing companies will continue to decline; however, a few key industries considered essential for the economy of Poland will continue to have some percentage of Government investment for the foreseeable future.

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TABLE 1
POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2,013	2014
METALS						
Aluminum, metal, secondary[e, 3]	metric tons	16,000	14,000	11,090	16,014 [r]	14,908
Cadmium, metal, primary	do.	451	526	370	460 [r]	628
Copper:						
Ore:						
Gross weight		30,805	31,241	31,725	32,215	32,613
Cu content	metric tons	480,600	479,300	479,250	481,770	473,258
Concentrate:						
Gross weight		1,842	1,877	1,862	1,858	1,843
Cu content	metric tons	425,400	426,700	427,064	429,275	421,695
Metal:						
Smelter:						
Primary	do.	469,700	481,900	466,700	456,100 [r]	476,100
Secondary	do.	94,600 [r]	82,100 [r]	108,900 [r]	114,600 [r]	108,700
Total	do.	564,300 [r]	564,000 [r]	575,600 [r]	570,700 [r]	584,800
Refined, electrolytically	do.	547,100	571,000	565,834	565,155	576,876
Gold, metal	kilograms	776	704	916	1,066	2,574
Iron and steel:						
Pig iron		3,638	3,975	3,944	4,014 [r]	4,637
Ferroalloys:						
Blast furnace, ferromanganese	metric tons	800	800	800	760 [e]	760
Electric furnace:						
Silicomanganese	do.	100	400	200	190 [e]	190
Ferrosilicon	do.	53,206	72,668	79,400	75,500 [e]	75,500
Other	do.	200	300	300	280 [e]	280
Total ferroalloys	do.	54,306	74,168	80,700	76,730 [e]	76,730
Steel, crude:						
From oxygen converters		3,995	4,424	4,333	4,399 [r]	5,067
From electric arc furnaces		4,001	4,353	4,206	3,551 [r]	3,492
Total		7,996	8,777	8,539	7,950 [r]	8,559
Finished steel products:						
Hot rolled		6,658	7,504	7,700	7,514 [r]	7,650
Cold rolled		835	807	755	815	800 [e]
Pipe (cold formed and hollow sections)		840	910	945	860	848
Lead:						
Mine output:						
Pb content of Pb-Zn ore	metric tons	35,300	28,200	26,600	25,000	34,000
Pb content of Cu ore	do.	24,900	24,900	30,000	26,710	43,000
Total	do.	60,200	53,100	56,600	51,710	77,000
Metal, refined:						
Primary	do.	38,000	47,000	47,000	39,000	36,000
Secondary	do.	82,000	87,000	87,000	103,000	112,000
Total	do.	120,000	134,000	134,000	142,000	148,000
Rhenium:						
Ammonium perrhenate:						
Gross weight	kilograms	6,709	8,650	11,630	10,800 [e]	10,800 [e]
Re content of ammonium perrhenate	do.	4,656	6,000	8,100 [e]	7,530	7,700
Rhenium metal in pellet form	do.	620	620 [e]	620 [e]	620 [e]	600 [e]
Selenium	metric tons	79	85	90	80	80 [e]
Silver:						
Mine output, Ag content of Cu concentrate	metric tons	1,181	1,167	1,149	1,199	1,384
Metal	do.	1,175	1,260	1,274	1,161	1,160 [e]
Zinc:						
Mine output, Zn content	do.	88,500	81,800	75,200	73,000	56,000
Metal, refined, primary and secondary	do.	135,100	144,100	138,300	154,379	164,000

See footnotes at end of table.

TABLE 1—Continued
POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS						
Cement:						
Clinker		11,768	13,630	11,807	10,855 [r]	11,864
Hydraulic		15,812	18,993	15,919	14,831 [r]	15,358
Clays and clay products:						
Bentonite:						
Crude	metric tons	2,200	900	800	1,018 [r]	1,000 [e]
Processed, including imported material	do.	86,000	113,800	102,100	105,000 [e]	100,000 [e]
Fire clay, crude		82	136	119	118 [r]	99
Kaolin:						
Crude		238	285	249	200 [r]	199
Beneficiated		125	164	138	150 [e]	150 [e]
Diatomite	metric tons	500	600	600	600	600 [e]
Feldspar:						
Run of mine	do.	513,700	550,000	376,500	374,000 [e]	374,000 [e]
Processed, including imported material	do.	485,000	538,800	487,200	500,000 [e]	500,000 [e]
Gypsum and anhydrite						
Natural:						
Gypsum rock		1,012	1,067	1,078	952	905
Anhydrite		167	158	150	133	147
Total		1,179	1,225	1,228	1,085	1,052
Synthetic gypsum		2,389	2,586	2,790	2,700 [e]	2,700 [e]
Grand total		3,568	3,811	4,018	3,785 [e]	3,752 [e]
Lime, hydrated and quicklime		1,799	2,036	1,799	1,709 [r]	1,782
Magnesite:						
Crude	metric tons	108,809	129,166	129,641	116,274 [r]	116,000
Concentrate	do.	63,000	75,000	84,000	97,000	97,000
Nitrogen, N content of ammonia		1,700	1,918	2,026	2,100 [e]	2,100
Quartz, quartzite, and quartz schist, marketable:						
Quartz and quartz crystal	metric tons	5,600	6,100	5,300	5,000 [e]	5,000
Quartzite, refractory	do.	34,200	46,500	53,200	50,000 [e]	50,000
Quartz schist	do.	700	700	600	550 [e]	550
Salt:						
Rock		1,236	1,234	793	1,320	775
Evaporated salt		411	415	658	686 [r]	642
Other (brine and desalination of mine waste water)		2,464	2,633	2,891	2,735 [r]	2,800 [e]
Total		4,111	4,282	4,342	4,741 [r]	4,217
Sand and gravel:						
Aggregates (construction sand and gravel), natural, mine output		157,236	248,690	184,745	173,267	174,000 [e]
Filling sand	thousand cubic meters	5,090	4,405	3,762	3,649	3,600 [e]
Foundry sand		1,053	1,475	1,206	1,311	1,300 [e]
Lime-sand brick production sand	thousand cubic meters	615	780	731	519	520 [e]
Moulding sand		1,817	2,096	2,934	2,900 [e]	2,900 [e]
Silica sand (glass sand), marketable		1,995	2,290	2,149	2,112	2,100 [e]
Sodium compounds:						
Carbonate (soda ash), 98%		1,010	1,061	1,111	1,052	1,000 [e]
Caustic soda (96% NaOH)		285	361	388	391	390 [e]
Stone, mine output:						
Dimension stone		4,598	6,224	4,118	3,800 [e]	3,800 [e]
Dolomite		1,821	1,880	1,830	1,915 [r]	1,346
Limestone:						
For lime production		17,588	21,703	16,728	16,808	16,000 [e]
For non-lime end use		35,528	47,929	40,178	38,000 [e]	38,000 [e]
Road stone		168	326	289	300 [e]	300 [e]

See footnotes at end of table.

TABLE 1—Continued

POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued						
Sulfur:						
Native, Frasch	metric tons	517,000	657,000	676,800	526,300	605,400
Byproduct:						
From natural gas	do.	24,900	23,800	25,300	24,300	24,300 [e]
From oil refineries and coking plants	do.	225,000	234,600	259,700	259,000 [e]	260,000 [e]
From metallurgy	do.	253,000	250,000 [e]	250,000 [e]	250,000 [e]	250,000 [e]
Other	do.	500	600	400	500 [e]	500 [e]
Total	do.	503,400	509,000 [e]	535,000 [r, e]	534,000	535,000 [e]
Grand total	do.	1,020,400	1,170,000 [e]	1,210,000 [e]	1,060,000	1,140,000 [e]
MINERAL FUELS AND RELATED MATERIALS						
Carbon black	metric tons	34,700	45,000	11,100	11,000 [e]	11,000 [e]
Coal:						
Bituminous		76,728	76,448	79,813	76,775	73,011
Lignite		56,510	62,841	64,280	65,849	63,877
Total		133,238	139,289	144,093	142,624	136,888
Coke		9,738	9,377	8,891	9,213	9,431
Gas:						
Natural	million cubic meters	5,666	5,825	5,871	5,883	5,800 [e]
Coke oven gas, manufactured	do.	4,239	4,200 [e]	3,873	4,079	4,000 [e]
Peat, fuel and agricultural		672	746	762	817 [r]	615
Petroleum:						
Crude[e, 4]	thousand 42-gallon barrels	5,100	4,600	5,000	7,100	7,014
Refinery products[e, 5]	do.	158,000	160,000	195,000	190,000	190,000

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto.

[1] Table includes data available through February 17, 2016.

[2] In addition to commodities listed, beneficiated barite, cobalt, gold content of copper concentrate, nickel, palladium, platinum, sulfate, and town gas were thought to have been produced, but available information was inadequate to make reliable estimates of output.

[3] Based on official Polish Government estimates.

[4] Figures were converted to barrels from production in metric tons, which was reported as the following: 2010—686,487; 2011—616,525; 2012—673,582; 2013—956,807; 2014—945,267.

[5] Figures were converted to barrels from production in metric tons, which was reported as the following: 2010—21,557,363; 2011—21,770,253; 2012—26,587,000; and 2013—25,849,000. Production for 2014 was estimated, as information was not available at the time the data were collected.

TABLE 2
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, secondary	Huta Aluminium Konin (Impexmetal S.A., 95.52%)	Konin	NA.
Do.	Boryszew S.A. Branch Modern Products Aluminium Skawina (Boryszew Capital Group, 100%)	Skawina	NA.
Do.	Grupa KETY S.A.	Kety	NA.
Do.	Nicromet	Bestwinka	NA.
Do.	Alumetal S.A.	Kety	NA.
Do.	POLST Sp. z o.o.	Walbrzych	NA.
Bentonite	Zaklady Gorniczo-Metalowe "Zebiec" S.A.	Starachowice	40.[e]
Cadmium, refined metric tons	Huta Cynku "Miasteczko Slaskie" S.A. (Stalprodukt S.A.)	Miasteczko Slaskie smelter	540.
Cement	Gorazdze Cement S.A. (HeidelbergCement AG, 100%)	Gorazdze	4,000 clinker, 5,600 cement.
Do.	Grupa Ozarow S.A. (CRH plc., 100%)	Plants at Ozarow and Rejowiec	2,800 clinker,[e] 3,250 cement.[e]
Do.	Cemex Polska Sp. Z o.o. (CEMEX S.A.B de C.V., 100%)	Plants at Chelm and Rudniki	2,300 clinker,[e] 3,000 cement.[e]
Do.	Cementownia Warta S.A. (Polen Zement Beteiligungsgeselschaft GmbH)	Dzialoszyn	1,500 clinker,[e] 2,000 cement.[e]
Do.	Lafarge Cement S.A.	Plants at Malogoszcz and Piechcin	3,000 clinker,[e] 5,700 cement.
Do.	Dyckerhott Sp. z o.o. (Dyckerhott/Buzzi Unicem's)	Nowiny	1,100 clinker,[e] 1,600 cement.
Do.	Cementownia "Nowa Huta" S.A.	Krakow	300 clinker,[e] 500 cement.[e]
Do.	Cementownia "Odra" S.A.	Opole	400 clinker,[e] 800 cement.[e]
Cement, aluminous	Gorka Cement Sp. z o.o.	Trzebinia	70 clinker,[e] 70 cement.[e]
Coal:			
Bituminous	Includes:	Of which:	90,000.[e, 2]
	100% Government owned:		
	Kompania Weglowa S.A.	Upper Silesia (14 mines)	
	Katowicki Holding Weglowy S.A.	Upper Silesia (4 mines)	
	Poludniowy Koncern Weglowy S.A.	Upper Silesia (2 mines)	
	KWK Kazimierz-Juliusz Sp. z o. o.	Upper Silesia (1 mine)	
	Jastrzebska Spolka Weglowa S.A. (Government, 55%)	Upper Silesia (5 mines)	
	Lubelski Wegiel "Bogdanka S.A." (Government, 5%)	Bogdanka, east of Leczna, eastern Poland (1 mine)	
	SILTECH Sp. z o. o.	Upper Silesia (1 mine)	
Brown coal and lignite	Includes:	Of which:	95,000.[e, 2]
	PGE KWB Belchatow S.A. [PGE Polish Energy Group Plc. (Government, 61.88%)]	Belchatow, south of Lodz (2 open pit mines)	
	PGE KWB Turow S.A. [PGE Polish Energy Group Plc. (Government, 61.88%)]	Bogatynia, at the southwest corner of Poland (1 mine)	
	Kopalnia Wegla Brunatnego "Konin" w Kleczewie S.A.	Kleczew (4 open pit mines)	
	Kopalnia Wegla Brunatnego "Adamow" S.A.	Turek (3 open pit mines)	
	Kopalnia Wegla Brunatnego Sieniawa Sp. z o.o.	Sieniawa (1 mine)	
Coke	Includes:	Of which:	10,800.[2]
	Zaklady Koksownicze Zdzieszowice (ArcelorMittal Poland S.A., 100%)	Upper Silesia (Zdzieszowice)	
	Koksownia Przyjazn S.A.	Upper Silesia (Dabrowa Gornicza)	
	Kombinat Koksochemiczny Zabrze S.A.	Upper Silesia (Cokeries at Jadwiga, Radlin, and Debiensko)	
	ArcelorMittal Poland S.A.	Upper Silesia (Krakow)	
	ISD Huta Czestochowa Sp. z o.o.	Upper Silesia (Czestochowa)	
	Zaklady Koksownicze "Victoria" S.A.	Upper Silesia (Walbrzychu)	
	CARBO-KOKS Sp. z.o.o.	Upper Silesia (Bytom)	

See footnotes at end of table.

TABLE 2—Continued

POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper:			
Ore, gross weight (averaged 1.57% Cu)	KGHM Polska Miedz S.A. (Government, 31.79%)	Lubin Mine, Lubin-Glogow District	7,000.
Do.	do.	Polkowice-Sieroszowice Mine, Lubin-Glogow District	11,000.
Do.	do.	Rudna Mine, Lubin-Glogow District	12,000.
Concentrate, gross weight (averaged 23.1% Cu)	KGHM Polska Miedz S.A. (Government, 31.79%)	Lubin beneficiation plant, Lubin-Glogow District	440.[e]
Do.	do.	Polkowice beneficiation plant, Lubin-Glogow District	520.[e]
Do.	do.	Rudna beneficiation plant, Lubin-Glogow District	940.[e]
Metal, refined	do.	Refineries at Glogow I, Glogow II, and Legnica	540.
Feldspar	Strzeblowskie Kopalnie Surowcow Mineralnych Sp. z o.o.	Sobotka, Lower Silesia, exploiting the Pagorki Zachodnie, Pagorki Wschodnie, and Strzeblow I deposits	652.
Do.	Pol-Skal Sp. z o.o.	Karpniki, southwestern region of Jelenia Gora	100.
Ferroalloys:			
Electric furnace (FeSiMn, FeMn, FeSi)	Huta Laziska S.A.	Upper Silesia at Laziska Gorne	120.[e]
Blast furnace (FeMn)	STALMAG Sp. z o.o.	Upper Silesia at Ruda Slaska	50.[e]
Gold, metal kilograms	KGHM Polska Miedz S.A. (Government, 31.79%)	Refinery at Glogow	1,000.[e]
Gypsum and anhydrite	Includes: Zaklady Przemyslu Gipsowego "Dolina Nidy" S.A. Rigips Polska Stawiany Sp. z o.o. (Saint-Gobain) Kopalnia Gipsu i Anhydrytu "Nowy Lad" Sp. z o.o.	Of which: Southeastern Poland, Gacki Southeastern Poland, Szarbkow Lower Silesia, mines at Niwnice and Iwiny	1,400.[2]
Helium million cubic meters	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.40%)	Western Poland, Odolanow	3.5.[e]
Kaolin, crude and washed	KSM "Surmin-Kaolin" S.A.	Lower Silesia, Nowogrodziec	90.[e]
Do.	Grudzen Las Sp. z o.o.	Grudzen Las, in Lodz Voivodeship	55.[e]
Do.	Tomaszowskie Kopalnie Surowcow Mineralnych "Biala Gora" Sp. z o.o.	Smardzewice, Tomaszowski Voivodeship	30.[e]
Lead-zinc:			
Mine output	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A. (Stalprodukt S.A., 86.92 %)	Mine and concentrator at Olkusz and Pomorzany, Bukowno region	30 lead,[e] 110 zinc.[e]
Metal:			
Pb, refined	Huta Cynku Miasteczko Slaskie (HCM) S.A.	Refinery at Miasteczko Slaskie	35.
Do.	"Baterpol" Sp. z o.o. (Impexmetal S.A.)	Refinery at Katowice	20.[e]
Do.	Orzel Bialy S.A.	Refinery at Bytom	40.[e]
Do.	KGHM Polska Miedz S.A. (Government, 31.79%)	Smelter at Legnica	50.[e]
Zn, refined	Huta Cynku Miasteczko Slaskie (HCM) S.A. (ZGH, 91%)	Imperial smelter at Miasteczko Slaskie	85.
Do.	Zaklady Metalurgiczny Silesia S.A.	Refinery at Katowice	12.
Do.	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A. (Stalprodukt S.A., 86.92 %)	Refinery at Boleslaw	75.
Lime	Includes: Zaklady Przemyslu Wapienniczego (ZPW) Trzuskawica S.A. (CRH plc, 100%) Lhoist Group: Lhoist Opolwap S.A. Lhoist Bukowa Sp. z o.o. Zaklad Wapienniczy Wojcieszow Sp. z o.o. Zaklady Wapiennicze Lhoist Sp. z o.o.	Of which: Plants in Sitkowka-Nowiny and Bielawy Tarnow Opolski, Opole County Bukowa, 90 kilometers north of Krakow Wojcieszow Gorazdze	2,200.[e, 2]

See footnotes at end of table.

TABLE 2—Continued

POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas	million cubic meters	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.41%)	Gasfields in southeastern Poland in the Carpathian Mountains, the Carpathian Foothills, and the Polish Lowlands	4,600.[e]
Do.	do.	FX Energy, Inc.	Western Poland	120.[e]
Do.	do.	LOTOS Petrobaltic S.A. [Grupa LOTOS S.A. (Government, 53.20%)]	Baltic Sea Shelf	20.[e]
Nitrogen:				
Ammonia (NH_3)		Includes:	Of which:	2,600.[e, 2]
		Zaklady Azotowe "Pulawy" S.A.	Pulawy in eastern Poland	
		Zaklady Azotowe "Kedzierzyn" S.A.	Kedzierzyn in Upper Silesia	
		Zaklady Azotowe "Anwil Wloclawek" S.A.	Wloclawek in central Poland	
		Zaklady Azotowe S.A. w Tarnowie	Tarnow in southern Poland	
		Azoty-Adipol S.A. (former Chorzow plant)	Chorzow in Upper Silesia	
		Zaklady Chemiczne "Police" S.A.	Police in northwestern Poland	
Petroleum:				
Crude	thousand 42-gallon barrels	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.41%)	Oilfields in southeastern and western Poland with about 75% of production from the Barnowko-Mostno-Buszewo field near Debno	4,000.[e]
Do.	do.	LOTOS Petrobaltic S.A. [Grupa LOTOS S.A. (Government, 53.20%)]	Baltic Sea Shelf	1,200.[e]
Do.	do.	FX Energy, Inc.	Western Poland	50.[e]
Refined	do.	Petrochimia-Plock [PNK Orlen S.A. (Government, 27.52%)]	Plock in central Poland	115,000.
Do.	do.	Rafineria "Gdansk" (Grupa LOTOS S.A.)	Gdansk in northern Poland	70,000.[e]
Do.	do.	Rafineria "Trzebinia" [PNK Orlen S.A. (Government, 27.52%)]	Trzebinia in southern Poland	3,000.
Do.	do.	Rafineria "Jedlicze" [PNK Orlen S.A. (Government, 27.52%)]	Jedlicze in southern Poland	1,000.
Rhenium:				
Rhenium content of ammonium perrhenate	kilograms	KGHM Ecoren S.A. [KGHM Polska Miedz S.A. (Government, 31.79%)]	Lubin	7,500.
Rhenium metal	do.	do.	do.	3,500.
Salt:		Includes:	Of which:	5,000.[e, 2]
Brine		Inowroclawskie Kopalnie Soli Solino S.A.	Mines at Gora and Mogilno in central Poland	
		Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.94%)	Mine at Mogilno in central Poland	
		Kopalnia Soli "Wieliczka" S.A.	Wieliczka in southern Poland, near Krakow, mining deposits at Barycz and Wieliczka	
Rock salt		Kopalnia Soli "Klodawa" S.A.	Klodawa in central Poland	
		KGHM Polska Miedz S.A. (Government, 31.79%)	Sieroszowice in southwestern Poland	
Desalination of mine wastewater		Zaklad Odsalania Wod Dolowych "Debiensko" Sp. z o.o.	Czerwionka-Leszczyny, west of Debiensko	
Selenium	metric tons	KGHM Polska Miedz S.A. (Government, 31.79%)	Refinery at Glogow	90.
Silver, refined	do.	do.	Precious metals plant at the Glogow smelter	1,400.
Do.	do.	Institute of Non-ferrous Metals	Gliwice	30.[e]
Steel, crude		ArcelorMittal S.A., of which:		8,000.
		ArcelorMittal Poland S.A.	Steelworks at Dobrowa Gornicza (former Huta Katowice S.A.)	
		do.	Steelworks at Krakow (former Huta Sendzimir S.A.)	
		ArcelorMittal Warszawa Sp. z o.o.	Steelworks in Warsaw (former Huta "Lucchini-Warszawa" Sp. z o.o.)	

See footnotes at end of table.

TABLE 2—Continued

POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude—Continued	CMC Zawiercie S.A. (Commercial Metals Co.)	Steelworks at Zawiercie	1,200.
Do.	ISD Huta Czestochowa S.A. (Industrial Union of Donbass Corp.)	Steelworks at Czestochowa	800.[e]
Do.	Celsa Huta Ostrowiec S.A. (Celsa Group)	Steelworks at Ostrowiec-Swietokrzyski	800.[e]
Do.	Ferrostal Labedy Sp. z o.o. (Cognor S.A.)	Steelworks at Gliwice	375.
Do.	Huta Stali Jakosciowych S.A. (Cognor S.A.)	Steelworks at Stalowa Wola	261.
Do.	Huta Batory Sp. z o.o. (Alchemia S.A., 100%)	Steelworks at Chorzow	150.[e]
Sulfur	P.P. Kopalnie i Zaklady Chemiczne Siarki "Siarkopol"	Osiek deposit at Grzybow	800.

[e] Estimated. Do., do. Ditto. NA Not available.

[1] The data presented in this table were compiled, in large measure, from information provided in the Minerals Yeabook of Poland 2012, which was prepared and published by the Division of Mineral Policy, Mineral and Energy Economy Research Institute of the Polish Academy of Sciences.

[2] Annual capacity listed is total for all deposits, mines, or companies that produce the commodity.

THE MINERAL INDUSTRY OF PORTUGAL

By Alberto Alexander Perez

In 2014, the gross domestic product (GDP) of Portugal (measured at market prices and using 2011 as the base year) was $231.6 billion[1] compared with $227.4 billion in 2013, for a nominal GDP growth rate of 1.9% and a reported real GDP growth rate of 0.9%. The country also reported an unemployment rate of 13.9% and a total employed workforce of 4.51 million people; the majority of the workforce was employed in the services, commerce, and industrial sectors. In the long term, Portugal's gross value added in the services sector had increased; in 2014, it reached 76.1% of total national production compared with 66.4% in 1995. In contrast, the gross value added of the country's industry, energy, water, and sewage sector decreased to 17.1% in 2014 from 21.6% in 1995, and that of its construction sector decreased to 4.5% in 2014 from 6.5% in 1995. Wages in Portugal in 2014 decreased by 0.2%, and the inflation rate was 0.2% in metropolitan Portugal, which resulted in a decrease of 0.4% in real salaries. The Government deficit in 2014 amounted to 2% of the country's GDP, and its national debt was equivalent to 130.2% of the GDP, making Portugal the third-most indebted country in the European Union (EU) after Greece and Italy.

Portugal ranked 13th in the EU in terms of GDP in 2014. The output value of its industrial sector accounted for 21.6% of the GDP (U.S. Central Intelligence Agency, 2015; Instituto Nacional de Estatística, 2015b, p. 23; 2015c, p. 208, 210, 314, 317, 642; World Bank, The, 2016).

Portugal is endowed with metallic and nonmetallic mineral resources, such as copper, feldspar, iron ore, kaolin, limestone, marble, tin, tungsten, and zinc. In 2014, the principal mineral commodities produced in Portugal for which information was available included gypsum, lithium (Portugal was the sixth-ranked producer in the world), ornamental stone, salt, silver, talc, and tungsten (ninth-ranked producer in the world) (table 1; Jaskula, 2016; Shedd, 2016). One-half of the Iberian Pyrite Belt (IPB) is in Portuguese territory, where volcanogenic massive sulfide deposits, such as the Neves-Corvo deposit, have been exploited. The IPB is considered the primary source of base metals in the EU, and it was under extensive exploration for various metallic minerals (Veiga, 2013).

Minerals in the National Economy

In 2014, the manufacture of fabricated metal products, except machinery and equipment, amounted to 6.5% of Portugal's sales and revenues, and the manufacture of coke and refined petroleum products amounted to 11.1%. The production from mining and quarrying decreased by 6.46% in 2014 compared with that of 2013 and amounted to 2.58% of all industrial production, whereas the production of energy decreased by 1.05% and amounted to 17.8% of all industrial production. The production of electricity, gas, steam, and air conditioning supply increased by 2.89% in 2014 and amounted to 15.69% of all industrial production. Most of the electricity produced in Portugal in 2014 was thermal electricity (46.8%), followed by hydropower-generated electricity (28.9%) and wind-generated electricity (23.3%). A total of 15,458 licenses were issued in 2014, of which 57.9% were licenses issued for new construction, which was a decrease of 5.5% in the number of new construction licenses issued compared with that of 2013, and a total of 14,846 construction projects were finished in 2014, of which 9,793 were new construction (Instituto Nacional de Estatística, 2015b, p. 35–36; 2015c, p. 467, 479).

Production

In 2014, metal production in Portugal had mixed results. The production of mined zinc increased by 32% compared with that of 2013; secondary lead, by an estimated 25%; and mined silver, by 6%, whereas the production of mined tin decreased by 11%, and copper, by 2%. The production of crude steel remained about the same as in 2013.

The production results in the industrial minerals sector were also mixed. The production of gypsum and anhydrite increased by about 10%, and that of clays (including kaolin) increased by about 7% compared with that of 2013. The production of salt, on the other hand, decreased by 85%, the reported production of lithium decreased by 12%, and the production of feldspar remained about the same as in 2013. The most notable changes in the production of sand and stone were the increases in the production of quartz by an estimated 75%; talc, 32%; basalt, about 24%; and limestone, 8%; and the decreases in the production of greywacke by an estimated 74%; schist and slate, 23% each; and granite, 19% (table 1).

Structure of the Mineral Industry

Companies that produce and process mineral commodities in Portugal were privately owned. The principal companies that produced metallic mineral commodities in 2014 were Sociedade Mineira de Neves-Corvo S.A. (Somincor) (owned by Lundin Mining Corp. of Canada), which produced copper and zinc concentrates; Pegmatítica-Sociedade Mineira de Pegmatites Lda. (with its main operation in Mangualde), which produced lithium minerals and pegmatite; and Sojitz Beralt Tin & Wolfram (Portugal) S.A. (owned by Sojitz Corp. of Japan), which produced tin and tungsten concentrates. Table 2 is a list of major mineral industry facilities, their locations, and their production capacities.

Mineral Trade

In 2014, Portugal's exports amounted to $64 billion, and its imports amounted to $78.8 billion. Portugal's exports to countries that were members of the EU amounted to $45.5 billion, and its imports from EU members were valued at $58.9 billion. The leading export partners, in terms of value, were Spain, which received 23.5% of Portugal's exports, Germany and France (11.7% each), Angola (6.6%), the United Kingdom (6.1%), and the United States (4.4%). Portugal's leading import partners were Spain, which supplied 32.6% of Portugal's imports; Germany (12.3%); France (7.1%); Italy (5.2%); the Netherlands (5.1%); the United Kingdom (3.1%); Angola, Belgium, and China (2.7% each); and the United States (1.6%) (Instituto Nacional de Estatística, 2015b, p. 30–31).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average annual exchange rate of EUR0.7489=$1.00 for 2014 and EUR0.73=$1.00 for 2013.

In 2014, the value of imported energy-producing mining and quarrying products was $10.3 billion, and the value of imported non-energy-producing mining and quarrying products amounted to $156 million and made up only 1.5% of the mining and quarrying imports. The value of exported energy-producing mining and quarrying products was $9.1 million, and that of non-energy-producing mining and quarrying products was $746 million. The value of imported mining and quarrying products made up 13.3% of the total value of all imported goods, and the value of exported mining and quarrying products made up 1.2% of all exports in 2014 (Instituto Nacional de Estatística, 2014c, p. 249, 401).

Commodity Review

Metals

Copper and Zinc.—Somincor is located 100 kilometers (km) north of Faro, in the western area of the IPB. The company held a mining concession covering an area of 13.5 square kilometers in the parishes of Santa Barbara de Padroes and Senhora da Graca de Padroes, The copper resources of the Neves-Corvo Mine were 14.2 million metric tons (Mt) of measured resources, 55.1 Mt of indicated resources, and 13.4 Mt of inferred resources at grades of 4.3%, 2.3%, and 1.7%, respectively. The proven reserves at Neves-Corvo were estimated to be about 6.3 Mt grading 3.9% copper, 1.1% zinc, 0.2% lead, and 39 grams per metric ton (g/t) silver, and the probable reserves were estimated to be 19.7 Mt grading 2.4% copper, 0.7% zinc, 0.2% lead, and 36 g/t silver (Lundin Mining Corp., 2015a, b).

The capacity of the Neves-Corvo's copper plant was about 2.6 million metric tons per year (Mt/yr) of ore extraction and 300,000 metric tons per year (t/yr) of concentrate production. Its zinc plant had the capacity to process about 1.0 Mt/yr of ore to produce 100,000 t/yr of concentrate. In 2014, Neves-Corvo reported that production from its Neves-Corvo copper mine was 51,369 metric tons (t) of copper content and 67,378 t of zinc content (Government estimates vary and were likely to be revised later). The decrease in copper production in 2014 was owing to an unexpected decrease in copper content in the copper ores mined in the first half of 2014. The increase in zinc production likely resulted from an increased proportion of zinc ore being derived from the higher grade Lombador Mine. The company reported that more than 50% of the zinc ore at the mine was being sourced from this area (Lundin Mining Corp., 2015a, b).

Tungsten.—On August 1, Colt Resources Inc. of Canada reported that it had obtained positive results from intercepts at two of the first three holes recently drilled in the gap zone at its Tabuaco tungsten project, which was part of the company's resource expansion drilling program that started on June 18. The company reported that, with respect to rock mechanics, the condition of the entire sequence intersected by these holes, both the mineralized zones and the hanging wall rocks, was very good and appeared to be superior to those encountered elsewhere on the project. The company hypothesized that the new deposit could extend further along the strike to the northwest as well as downdip to the southwest beneath the granite body. The company reported that the drilling program would continue and that a series of followup drill holes were being drilled nearby to develop a better understanding of the three-dimensional geometry of this new zone (Colt Resources Inc., 2014, p. 1–2).

Sojitz Beralt Tin & Wolfram (Portugal) operated the Panasqueira tungsten mine located in Barroca, Castelo Branco District, in east-central Portugal. The mine was one of the EU's leading producers of tungsten concentrate, with a production capacity of 1,300 t/yr of tungsten trioxide concentrate (WO_3). In 2014, the tungsten content in concentrate was 671 t compared with 692 t in 2013 (tables 1, 2).

Industrial Minerals

Cement.—Cimentos de Portugal, SGPS, S.A., which was owned by Grupo Camargo Correa, continued to be Portugal's leading cement producer. The company had a worldwide cement production capacity of 46.9 Mt/yr, of which 9.1 Mt/yr was in Portugal. The company reported that it had sold 4.371 Mt of cement and clinker in Portugal in 2014 and 30.36 Mt worldwide, making its Portuguese sales about 14.4% of its total sales in 2014. The company employed 863 people in Portugal in 2014. The company reported that the construction sector in Portugal was sensitive to the cutback in private investment and budgetary constraints by the Government, which affected cement consumption in the country. The company reported that positive signals in the market were observed in 2014, although the evolution of the construction market was still unfavorable (Cimentos de Portugal, SGPS, S.A., 2015, p. 21, 29).

Mineral Fuels and Other Sources of Energy

Renewable Energy.—In 2014, 61.4% of the energy produced in Portugal was from renewable sources; this was an increase of 3.7% compared with that in 2013 and was equivalent to 2.787 Mt of oil equivalent. This increase was mainly owing to the increase in use of hydropower for the production of electricity. In 2014, hydropower represented 50.6% of all electricity produced by renewable sources, followed by wind power, 37.4%, and thermal power, 9.4%; the remainder was produced by other sources, such as solar and geothermal (Instituto Nacional de Estatística, 2015a, p. 129).

Outlook

Portugal's current economic conditions are not conducive for a rapid expansion of its minerals sector. The country's economy is recovering slowly, however, and this recovery could lead to investment opportunities for its construction industry.

Production of metal ores and concentrates in Portugal is expected to increase, and projects such as the Neves-Corvo Mine and the Tabuaco tungsten project will likely increase the interest of investors in the country. Continued investments in alternative energy sources, particularly hydroelectric and offshore wind farms, could further decrease the country's dependence on imported energy; however, the lack of other sizable energy resources will continue to make Portugal dependent on imported energy sources for the foreseeable future.

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TABLE 1
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Copper, mine output, Cu content		74,426	79,686	74,043	77,236	75,433
Lead, refined, secondary		9,000	6,000	5,000	4,000	5,000 [e]
Silver, mine output, Ag content	kilograms	23,710	28,380	27,244	37,025	39,350
Steel, crude	thousand metric tons	1,543	1,942	1,960	2,050	2,070
Tin, mine output, Sn content		22	39	42	84	75
Tungsten, mine output, W content		799	819	763	692	671
Zinc, mine output, Zn content		6,421	4,227	30,008	51,026	67,384
INDUSTRIAL MINERALS						
Barite		15	--	--	--	--
Cement, hydraulic	thousand metric tons	7,200 [3]	7,200 [3]	7,200	7,500 [e]	7,500 [e]
Clay, kaolin, washed and unwashed		273,890	322,091	321,039	248,008 [r]	264,872
Feldspar		121,827	114,600	109,273	70,057	70,865
Gypsum and anhydrite		336,755	337,272	321,988	299,038	328,730
Lithium minerals, pegmatite (1.5% Li)		40,109	37,534	20,698	19,940	17,459
Salt, rock		618,961	631,295	520,284	473,095	69,702
Sand	thousand metric tons	7,933	7,209	7,248	6,110	6,490 [e]
Stone:						
Basalt		240,150	361,414	325,388	242,821 [r]	300,000 [4]
Calcareous:						
Dolomite	thousand metric tons	257	195	--	--	--
Limestone, marl, calcite	do.	33,756	30,477	25,260	21,275 [r]	23,000 [e]
Marble	do.	94	125	292	418	NA
Gabbro	do.	693	94	467	296 [r]	NA
Granite, ornamental	do.	21,436	21,758	19,099	13,630 [r]	11,000 [4]
Graywacke	do.	NA	526	104	74	19 [4]
Quartz	do.	31	29	38	4 [r]	7
Quartzite	do.	45	53	42	30 [r]	NA
Schist	do.	83	70	925	147 [r]	113
Slate	do.	NA	NA	13	13	10
Talc		11,981	15,462	15,131	11,349	14,942
MINERAL FUELS AND RELATED MATERIALS						
Petroleum refinery products[e]	thousand 42-gallon barrels	92,000 [r]	83,000 [r]	87,600 [r]	104,000 [r]	105,000 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through February 16, 2016.

[2] In addition to the commodities listed, aluminum (secondary), ammonia, beryl concentrate, calcium carbonate, granite (crushed), iron ore and concentrate, lime (hydrated lime and quicklime), manganese, manufactured gas, metallurgical coke, pig iron, pyrite and pyrrhotite (including cuprous), refractory clay, sodium compounds, steel (hot-rolled), sulfur, syenite, and white arsenic were thought to be produced, but available information was inadequate to make reliable estimates of output.

[3] Reported by Cimentos de Portugal, SGPS, S.A.

[4] Estimated by Statistics Portugal.

TABLE 2
PORTUGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Calcium carbonate		Omya Mineral Portuguesa Lda. (Salmon & Cia Lda., 50%, and Omya AG, 50%)	Mine and plant at Fatima	100
Cement		Cimentos de Portugal, SGPS, S.A. (Cimpor) (Grupo Camargo Correa, 94.19%)	Plants (3) at Alhandra, Loule, and Souselas	9,100
Do.		Companhia Geral de Cal e Cimento, S.A. (Secil) [Sociedade de Investimento e Gestão, SGPS, S.A. (Semapa), 100%]	Plants at Setubal, Leiria, and Alcobaca	4,000
Copper, concentrate		Sociedade Mineira de Neves-Corvo (Somincor), S.A. (Lundin Mining Corp., 100%)	Neves-Corvo Mine and processing plant near Castro Verde	300
Do.		do.	Lombador Mine near Castro Verde	20
Do.		Minas do Alentejo, S.A. (Almina)	Alentejo	NA
Diatomite		Sociedade Anglo-Portugesa de Diatomite Lda.	Mines at Obidos and Rolica	150
Kaolin		Saibrais Arelas e Caulinos S.A. (Denain Anzin Mineraux S.A.)	Mines at Casal dos Bracais and Mosteiros	175
Lithium minerals, pegmatite		Pegmatítica-Sociedade Mineira de Pegmatites Lda	Mangualde	NA
Petroleum, refined	42-gallon barrels per day	Petróleos de Portugal S.A. (Galp Energia, SGPS, S.A., 100%)	Refineries at Porto and Sines	330,000
Pyrite		Minas do Alentejo, S.A. (Almina)	Alentejo	NA
Steel, crude		Siderurgia Nacional S.A. (Metalúrgica Galaica S.A., 100%)	Steelworks at Maia and Seixal	600
Steel, semimanufactured		Lusosider Aços Planos S.A.	Rolling mill at Seixal	550
Stone, natural	thousand square meters	Airemármores – Extração de Mármores Lda	Serra de Aire, 6 quarries	100
Do.		Granital - Granitos de Portugal, S.A. (EIP Group, 60%)	Quarries at Bardeira, Chacins, Favaco, Maria Ribeira, Pedra da Moura, Pedra do Guarda, Preto F, and Rosa Sta. Eulalia	NA
Tin	metric tons	Sojitz Beralt Tin & Wolfram (Portugal) S.A. (Sojitz Corp., 100%)	Panasqueira Mine and plant at Barroca	42
Tungsten, concentrate	do.	do.	do.	1,300
Zinc, concentrate	do.	Sociedade Mineira de Neves-Corvo (Somincor), S.A. (Lundin Mining Corp., 100%)	Neves-Corvo Mine and processing plant near Castro Verde	100,000

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF ROMANIA

By John R. Matzko

Romania's mineral production was not globally significant in 2014; however, the country had potentially significant mineral resources for ferrous and nonferrous metals, natural gas, petroleum, precious metals, and salt. Romania principally produced alumina, primary and secondary aluminum, cement, coal, copper ore, pig iron, lead, steel, and zinc (table 1; National Agency for Mineral Resources, 2016a).

Romania's nominal gross domestic product (GDP) increased to $199 billion in 2014. The services sector made the most significant contribution to the GDP at 53.3% of the total, followed by the industrial sector, which contributed 24.1%. Construction contributed 6.3% to the GDP, and agriculture, forestry, and fishing together contributed 4.7%. In 2014, the gross industrial production index increased by 6.1%, supported by a 7.5% increase in manufacturing and a 1% increase in mining and quarrying (National Institute of Statistics, 2014a, p. 6; 2015b, p. 50, 51; International Monetary Fund, 2015).

Minerals in the National Economy

The number of active enterprises in the mining and quarrying sector increased by 1.3%, from an estimated 1,072 in 2013 to an estimated 1,086 during the first half of 2014 (the latest year for which data were available). The number of construction enterprises increased by 3.3%, from 45,382 in 2013 to 46,868 in 2014 (National Institute of Statistics, 2015b, p. 60).

The mining and quarrying sector in Romania employed an average of 60,950 people in 2014. Of these, 21,260 were employed in the extraction of crude oil and natural gas, 19,060 in mining of coal and lignite, 2,630 in mining of metal ores, 9,130 in other mining and quarrying, and 8,880 in mining support services. In the manufacturing sector, 3,920 people worked on the manufacture of coke and refined petroleum products, 36,580 on the manufacture of nonmetallic mineral products, 30,050 on the manufacture of basic metals, and 70,490 on fabricated metal products (National Institute of Statistics, 2015a, p. 80–81).

Government Policies and Programs

The primary laws regulating mineral and mining activities in Romania are law No. 238/2004 (the Petroleum Law) and law No. 85/2003 (the Mining Law); the latter was adopted in 2003 and amended in 2005, 2007, and 2009. Mineral rights are acquired through prospecting, exploration, and exploitation permits or concessions granted by the National Agency for Mineral Resources (NAMR). An exploration concession is valid for up to 5 years and is renewable for a maximum of 3 years. The concession gives the holder the exclusive right to explore for any minerals that may occur within the concession area. Exploitation concessions are granted for initial terms of 20 years and are renewable for successive 5-year periods. Exploitation concessions give the holder the right to explore, exploit, process, refine, and trade all minerals (except oil, gas, and radioactive materials) occurring within the area of the concession. Upon completion of the exploration phase, the concession may be converted into an exploitation concession with the submission to NAMR of several reports and documents—a final exploration report, an application for conversion, a feasibility study, a mine plan, an environmental impact assessment (EIA), an environmental rehabilitation plan, a social impact statement, and any other relevant documents as may be requested by the agency (Gabriel Resources Ltd., 2015, p. 20–21; National Agency for Mineral Resources, 2016b, c).

Production

In 2014, significant production increases were noted for sand and gravel, which increased by 98% compared with that of 2013; pig iron, by an estimated 23%; and gypsum, by about 19%. Smaller production increases were estimated for caustic soda (nearly 8%); crude steel (6%); and primary aluminum, bentonite, and cement (about 5% each). Several commodities showed decreased production in 2014; among these, the most significant decreases were estimated for secondary refined lead (14%), feldspar (12%), alumina (7%), and coal (5%) (table 1).

Structure of the Mineral Industry

Since joining the European Union (EU) in 2007, Romania's mineral sector had been in transition from the Government owning the majority of firms to the majority of firms being privately owned. At the end of 2013, state-owned enterprises constituted 44% of the energy and gas sector and 18% of the mining and quarrying sector. The state owns all mineral resources in the country as well as in the portion of the continental shelf of the Black Sea that adjoins Romania. In November 2014, the Government's energy department sought interest in the privatization of Societatea Complexul Energetic Hunedoara S.A. (Hunedoara Energy Complex), which generated thermal and electric power from coal. It was also announced in 2014 that the state-owned uranium miner Compania Nationala a Uraniului (CNU) would merge with Societatea Nationala Nuclearelectrica (SNN), which was the state nuclear power corporation (World Nuclear Association, 2014; Gabriel Resources Ltd., 2015, p. 20; Marrez, 2015, p. 2; Velicu, 2015, p. 147).

The NAMR is the authority that applies the provisions of the mining and petroleum laws (as amended and supplemented), and manages the oil, gas, and mineral resources of the country. Table 2 is a list of the major mineral-related industrial facilities operating in Romania in 2014 (National Agency for Mineral Resources, 2016d).

Mineral Trade

In 2014, total imports increased by 5.9%, reflecting an increase in domestic consumption. Approximately 75% of imports came from the EU. In 2014, the value of imported goods amounted to an estimated $78 billion,[1] of which base metals accounted for approximately $5 billion; crude petroleum and natural gas, $5 billion; fabricated metal products (except machinery and equipment), $3.5 billion; coke and refined petroleum products, $2.1 billion; other nonmetallic mineral products, $1 billion; metal ores, $275 million; other mining and quarrying products, $110 million; and coal and lignite, $86 million. Base metals and articles thereof constituted 10.8% of total imports, and mineral products constituted 9.9% (National Institute of Statistics, 2014b, p. 7, 44, 45; World Bank Group, 2015, p. 2).

Romania's exports increased by 5.8% in 2014; approximately 70% of total exports went to the EU. In 2014, the value of exported goods amounted to an estimated $70 billion, of which basic metals accounted for approximately $3.8 billion; coke and refined petroleum products, $3.6 billion; fabricated metal products (except machinery and equipment), $2.1 billion; other nonmetallic mineral products, $432 million; metal ores, $72 million; other mining and quarrying products, $52 million; crude petroleum and natural gas, $34 million; and coal and lignite, $0.8 million. Base metals and articles thereof constituted 9% of total exports, and mineral products constituted 6.2%. Romania was a net importer of most of these mineral-related products, and showed a trade deficit of $7 billion in the cited categories in 2014 (National Institute of Statistics, 2014b, p. 5, 42, 43; World Bank Group, 2015, p. 2).

Romania's leading import partners in 2014 were, in terms of value, Germany (which supplied 19.1% of Romania's total imports), Italy (10.8%), Hungary (7.9%), France (5.7%), and Poland (4.6%). The country's leading export partners were, in terms of value, Germany (which received 19.3% of Romania's total exports), Italy (11.9%), France (6.8%), Hungary (5.1%), and Turkey (4.5%) (National Institute of Statistics, 2014b, p. 7, 9).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Alum S.A., which was owned by Vimetco N.V., was the only alumina refinery in Romania. In 2014, the company's alumina production decreased by 7% to 363,000 metric tons (t) from 391,000 t in 2013. During the same period, bauxite production, which was provided by Sierra Mineral Holdings 1 Ltd. (a subsidiary of Vimetco in Sierra Leone), nearly doubled to 1.2 million metric tons (Mt), from the 616,000 t produced in 2013. In 2014, primary aluminum produced by Alro S.A. (a subsidiary of Vimetco in Slatina) increased by 5% to 263,000 t from 250,000 t in 2013. Processed aluminum production at Alro increased to 98,600 t in 2014 from 93,600 t in 2013. During 2014, Alro continued its investment and technological updating programs, including reconditioning of electrolytic pots and opening new aluminum scrap processing facilities. In addition, an investment of $6 million was finalized in 2014 for the acquisition of a new high-performance extrusion press (table 1; Vimetco N.V., 2015, p. 5, 14–16, 113).

Copper.—The Metaliferi Mountains of northwestern Romania contain a dense concentration of mineral deposits related to Miocene-age magmatism. Copper mineralization occurs in the region in porphyry-copper-type systems; other mineralization includes gold, silver, and base metals in veins, breccia pipes, and replacement bodies. The largest deposit is the Rosia Poieni porphyry copper deposit in Abrud, which hosts the Rosia Poieni Mine (the largest copper mine in Romania). Estimated reserves at Rosia Poieni were 900 Mt of copper ore and accounted for 60% of the copper reserves in the country. In July 2014, the Government granted an environmental permit to S.C. Cupru Min S.A. Abrud, which was the state-owned operator of the mine, to exploit the copper deposits at the site. As of late 2014, the company had 531 employees and had been unsuccessful in its efforts to privatize (Alba24.ro, 2014; Cioaca and others, 2014, p. 24).

Gold.—In June 2014, Romania's Lower House of Parliament rejected proposed legislation that would have allowed Gabriel Resources Ltd. of Canada to proceed with the Rosia Montana open pit gold mine project. The decision was prompted by continued opposition from environmental and community groups over concerns regarding the preservation of historical sites and potential environmental damage. The project was wholly owned by Rosia Montana Gold Corp. (RMGC), in which Gabriel Resources had an 80.69% interest and the Government (through Minvest, a state-owned mining company) held the remaining 19.31% interest. The Parliament had also rejected proposed changes to general mining legislation that would have helped the project. Earlier in the year, Gabriel Resources laid off nearly 400 employees, or 80% of the workforce, at RMGC (Ilie, 2014; Gabriel Resources Ltd., 2015, p. 24–25).

Other gold projects in Romania included the Rovina Valley gold and copper project led by Carpathian Gold Inc. of Canada, which was awaiting approval of a mining license from the Government, and the Certej project, which was owned by Deva Gold S.A. (a joint venture between Eldorado Gold Corp. of Canada and state-owned Minvest Deva). In April 2014, Eldorado Gold released a National Instrument 43–101 technical report on the project, which included the findings of an updated prefeasibility study. The company spent $12.2 million on the project in 2014, primarily on geologic and metallurgical testing, site preparation, and engineering studies (Eldorado Gold Corp., 2015; Jamasmie, 2015; Mining Watch, 2015).

Iron and Steel.—The production levels of crude steel and finished steel products in Romania changed little in 2014 compared with those of 2013. Crude steel production increased by 6% to 3.16 Mt in 2014 from 2.99 Mt in 2013, which was the lowest level since 2010 (table 1).

Invest Nikarom SRL restarted production in August 2014 at the Laminorul SA steel plant in Braila, which had been closed in 2012 when it was controlled by Mechel OAO of Russia. Invest Nikarom had purchased all five of Mechel's Romanian steel plants in 2013 and also owned Ductil Steel Buzau, Ductil Steel Otelu Rosu, Mechel Campia Turzii, and Mechel Targoviste, although Mechel still retained some indirect control over the factories because of the large debt still owed to Mechel. Laminorul Braila announced that it would hire 234 people for the first production run of 10,000 t of steel products for shipyards and the construction industry. In 2014, the number of people employed in the steel industry was 19,300 (Romania-Insider, 2014; Bernovici, 2015; Ministerul Economiei, Comertului si Turismului, 2015, p. 9).

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.75=US$1.00 for 2014 and EUR0.68=US$1.00 for 2013.

In late 2014, ArcelorMittal Galati, which was Romania's largest steel plant in terms of production, announced that it expected to increase its output in 2015 by 15%, to more than 2 million metric tons per year (Mt/yr) from 1.6 Mt/yr in 2014. The production increase would follow major technical upgrades to its production line made possible by a $120 million investment program that started in 2011 and included upgrades to the only currently operating blast furnace at the plant and the steel melting shop (Chirileasa, 2014b).

Industrial Minerals

Cement.—In Romania, the construction industry was in decline in 2014 owing in part to decreased investment in infrastructure, although investment in residential and nonresidential building projects increased by 32.6% and 16.6%, respectively. Overall, cement consumption increased by 5.6% in 2014 compared to that of 2013. Holcim Ltd. of Switzerland operated a cement production facility in Romania through its subsidiary Holcim (Romania) S.A. Despite a slow recovery in most European economies, Holcim (Romania) reported significant increases in 2014 owing to large projects in the Bucharest area. As of 2014, Holcim (Romania) had 792 employees and a production capacity of 6.1 Mt/yr.

HeidelbergCement AG of Germany owned cement production facilities in Romania through its subsidiary Carpatcement Holding S.A. At the company's Fieni plant, construction was started on an installation to generate electricity from kiln waste heat, which was expected to come online in the second half of 2015. HeidelbergCement's production capacity in 2014 was about 6.0 Mt/yr.

Lafarge S.A. of France, through its subsidiary Lafarge Ciment (Romania) S.A., operated two cement plants and one grinding plant in Romania, which had a combined cement production capacity of 4.9 Mt/yr and a 31% market share in the country. Lafarge's cement output increased by 2% following a 16% decrease in 2013 owing to increased demand in the residential sector. A proposed merger between Lafarge and Holcim was announced in April 2014; the transaction was expected to be completed in July 2015. As part of the merger, Lafarge would sell its assets in Romania (Chirileasa, 2014a; HeidelbergCement AG, 2015a; 2015b, p. 63, 290; Holcim Ltd., 2015, p. 88; Lafarge S.A., 2015, p. 29, 57).

Mineral Fuels and Related Materials

Coal.—Romania ranked seventh among the coal-producing EU countries, even though domestic production had decreased in recent years. In 2014, hard (bituminous) coal production decreased by 17% to 1.5 Mt from 1.8 Mt in 2013. Lignite production decreased by 4% to 22.0 Mt in 2014 from 22.9 Mt in 2013. Romania's hard coal resources were estimated to be 2.2 billion metric tons (Gt), of which 592 Mt was commercially exploitable within current lease areas. Most of the hard coal deposits are located in the Jiu Valley coal basin of southwestern Romania. Lignite resources were estimated to be 11.6 Gt, with proven reserves of 986 Mt. Most lignite deposits (about 95%) are located in the Oltenia mining basin, also in southwestern Romania. More than 80% of these deposits could be exploited by open pit methods. It was estimated that the leased lignite reserves could be exploited for another 15 years at a production level of about 30 Mt/yr, and hard coal deposits could be exploited for 36 years at the current production level of about 1.5 Mt/yr. The production capacity for lignite was about 33 Mt/yr, whereas domestic consumption was only about 22 to 23 Mt/yr, resulting in a production overcapacity of about 10 Mt/yr. In contrast, hard coal production did not meet domestic demand, and Romania imported approximately 1.1 Mt of coal in 2014. Romania's entire output of hard coal and lignite was used for heat and power generation. In 2013, coal-fired powerplants provided 27.25% of the country's total energy needs (National Institute of Statistics, 2014a, p. 84; European Association for Coal and Lignite, 2015, p. 20; Stanciu, 2015).

Restructuring of the hard coal sector, which was completed at the end of 2012, created two operating units—The National Society for Mine Closure Jiu Valley, which would oversee the closure of three unprofitable mines in the valley by 2018 and result in the loss of 2,400 jobs; and The Mining Division of the Hunedoara Energy Complex, which would continue to operate the remaining four coal mines and was expected to be the only hard coal producer in Romania after 2018. Complexul Energetic Oltenia (Oltenia Energy Complex) was Romania's leading producer of coal-based energy and was responsible for 99% of the country's lignite production. In 2014, the company had 19,000 employees (European Association for Coal and Lignite, 2015, p. 14; Stanciu, 2015).

Petroleum.—Romania had the fourth-largest crude oil reserves in Europe, with 600 million barrels (Mbbl) of proved reserves as of January 1, 2014. The country had the fifth-largest natural gas reserves in Europe; proven reserves were estimated to be 105 billion cubic meters as of January 1, 2014. In 2014, Romania produced 29.1 Mbbl of crude oil and about 11 billion cubic meters of natural gas. The country imported 50 Mbbl of crude oil and 556 million cubic meters of natural gas in 2014 (National Institute of Statistics, 2014a, p. 84; U.S. Energy Information Administration, 2014).

S.C. OMV Petrom S.A. (Petrom) was the largest integrated oil and gas group in southeastern Europe; it operated 239 commercial oil and gas fields in Romania. Its business segments included crude oil and natural gas exploration and production, power generation, refining, and marketing. OMV Aktiengesellschaft of Austria owned 51% of OMV Petrom. In 2014, Petrom produced 29 Mbbl of crude oil in Romania, which was the country's entire crude oil production. The company also produced 5.29 billion cubic meters of natural gas, which was approximately 50% of the country's natural gas production. Offshore production accounted for approximately 7% of oil production and 26% of natural gas production. Petrom invested in new technologies and secondary recovery techniques to redevelop mature fields to improve oil and gas recovery and to stabilize declining production rates. In early 2014, a workover program significantly contributed to the stabilization and gradual increase in hydrocarbon production during the second half of the year. Crude oil recovered through enhanced recovery techniques accounted for approximately 25% of total domestic oil production in 2014. Crude oil produced by OMV Petrom was refined primarily at the company's Petrobrazi refinery, which processed 28 Mbbl of crude oil in 2014 (the same amount as in 2013). The refinery utilization rate decreased slightly in 2014 to 89% compared with 90% in 2013 owing to a 1-month planned shutdown to complete a $450 million modernization program. As of yearend 2014, Petrom's proven reserves in Romania were estimated to be 355.6 Mbbl of crude oil and 48.3 billion cubic meters of natural gas. In 2014, Petrom announced two important discoveries. The Marina 1 exploration well in the Istria block encountered a new oil reservoir, which was under assessment. The Padina Nord 1 exploration well (a joint venture with Hunt Oil), identified a new oil and gas field in Buzau County, which was the largest oil and gas discovery in the Moesian platform within the past 30 years. The company also continued exploration work in the Neptun Block in the Black Sea. In 2014, OMV Petrom employed 16,948 people, which was a 14% decrease from the number employed in 2013 (S.C. OMV Petrom S.A., 2015, p. iii, 5, 9, 11, 31, 32, 35, 39, 40, 51).

Uranium.—Romania was one of only two EU countries currently mining uranium—the other was the Czech Republic. In 2014, all Romanian uranium production was from a mine in Suceava County that exploited the Crucea and Botusana deposits. The mine was operated by state-owned Compania Nationala a Uraniului (CNU). The mine had been in operation for nearly 30 years, and the ore was expected to be depleted and the mine closed in 2015. Looking ahead, the CNU was planning to develop the Tulghes-Grinties deposit in the East Carpathian area. The Government planned to invest about $130 million in developing the deposit and expected mine output to be 124,000 metric tons per year during a 9-year mine life. The CNU also considered building a new uranium processing and refinement plant in the area using advanced technology. Another uranium deposit was located in the Highis-Drocea Mountains in the west (Stroe, 2013; Radut, 2014; World Nuclear Association, 2014).

The Cernavoda nuclear powerplant, which is located in southeastern Romania, had two operating reactors identified as Units 1 and 2; together, these reactors generated almost 20% of the country's electricity. Additionally, three partially completed reactors were located on the same site. The plant was operated by Societatea Nationala Nuclearelectrica, which was the state nuclear power corporation. In July 2014, a binding and exclusive cooperation agreement was signed between China Nuclear Power Engineering Co. (CNPEC), which was a subsidiary of China General Nuclear Power Group (CGN), and Candu Energy Inc. of Canada, to complete the construction of reactor Units 3 and 4 at the powerplant. The agreement followed on the November 2013 letter of intent signed by CGN and Nuclearelectrica for investment in and development of Cernavoda reactor Units 3 and 4. In mid-2014, the Industrial and Commercial Bank of China agreed to finance the $8.7 billion project. The new reactors were expected to have operating lives of 30 years with the possibility of a 25-year extension. The first of the new reactors, Unit 3, was expected to be operational in 2023, and Unit 4 was expected to be operational in 2024. Each of these two reactors would have 720 megawatts of electricity-generating capacity (World Nuclear Association, 2014; Euratom Supply Agency, 2015, p. 11).

Outlook

Romania's economic growth is expected to remain robust in 2015 and 2016. The economy grew by 2.8% in 2014, and real GDP growth is projected to be about 3.4% in 2015 and 3.9% in 2016, driven mainly by the recovery in domestic consumption and strong exports. Performance in the mineral and mining sectors is expected to remain mixed. Steel production, while significantly below the pre-2009 peak levels, was relatively stable during the past 3 years at about 3 Mt. The Invest Nikarom steel plants were undergoing reorganization in 2014 and had limited production during the year. Despite potentially significant gold and silver production and the creation of associated jobs, the lack of public support and of Government progress on favorable mining legislation is likely to hinder growth in this sector in the long term. In 2015, the cement market, and construction activity in general, could increase by an estimated 3% to 5% compared with that of 2014 if the European Commission approves the Transportation General Master Plan in 2015 (Cembureau, 2015, p. 20; International Monetary Fund, 2015; S.C. OMV Petrom S.A., 2015, p. 26).

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TABLE 1
ROMANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Alumina, calcined, gross weight		450,000 [e]	520,000 [e]	414,000	391,000	363,000
Aluminum:						
Primary[e]		240,000	260,000 [r]	249,000 [r]	250,000	263,000
Secondary		18,282	23,970	16,955	14,531	14,500 [e]
Total[e]		258,000	284,000 [r]	266,000 [r]	265,000	278,000
Copper:						
Mine output, Cu content of concentrate[e]		5,000	6,500	6,300	6,800	7,000
Metal, refined:						
Primary		3,000	--	--	--	--
Secondary[e]		1,000	--	--	--	--
Total		4,000	--	--	--	--
Gold, mine output, Au content[e]	kilograms	400	--	--	--	--
Iron and steel:						
Metal:						
Pig iron	thousand metric tons	1,726	1,595	1,580	1,330	1,631
Ferroalloys, electric furnace:[e]						
Ferrochromium		14,000	--	--	--	--
Silicomanganese		20,000	31,000	17,000	--	--
Total		34,000	31,000	17,000	--	--
Steel, crude	thousand metric tons	3,721 [r]	3,828 [r]	3,292	2,985	3,158
Finished products:						
Pipes and tubes	do.	678	799	781	664	650 [e]
Rolled products	do.	3,762	4,061	3,472	2,845	2,800 [e]
Lead, refined:						
Primary		11,000	6,500	1,500 [e]	1,100 [e]	--
Secondary		4,000	7,000	13,200 [r]	14,000	12,000 [e]
Total		15,000	13,500	14,700 [r, e]	15,100 [e]	12,000 [e]
Manganese, ore:[e]						
Gross weight	thousand metric tons	--	5	5 [r]	--	--
Mn content	do.	--	1	1	--	--
Zinc metal, refined, primary and secondary		200	220	330	220	220 [e]
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	7,000	7,846	8,223	7,451	7,850 [e]
Clays:						
Bentonite, marketable		20,000 [e]	18,008	18,127	21,051	22,000
Kaolin, marketable		500	--	--	--	--
Feldspar[e]		5,500	2,500	6,500	6,800	6,000
Fluorspar[e]		15,000	--	--	--	--
Graphite		7,000	--	--	--	--
Gypsum	thousand metric tons	600 [e]	834	765	676	807
Lime	do.	1,700 [e]	1,679	1,708	1,698	1,700
Nitrogen, N content of ammonia[e]	do.	80	160	115	85	85
Salt:[e]						
Rock	thousand metric tons	40	40	40	40	40
Other	do.	2,400	2,500	2,200	2,200 [r]	2,200
Total	do.	2,440	2,540	2,240	2,240 [r]	2,240
Sand and gravel	do.	2,700 [e]	5,873	5,015	3,244	6,422
Sodium compounds:						
Caustic soda[e]	do.	300	540	292 [3]	171 [3]	184
Soda ash, 100% Na_2CO_3 basis	do.	350	420	430 [e]	430 [e]	425 [e]
Sulfuric acid[e]		383	2,100	410	150	150
Talc[e]		307	100	1	-- [3]	--

See footnotes at end of table.

TABLE 1—Continued
ROMANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous and lignite	thousand metric tons	30,000 [e]	35,000 [e]	33,902	24,723	23,556
Gas, natural, gross:						
Associated	million cubic meters	1,161	1,166	1,150	1,161	1,200 [e]
Nonassociated	do.	9,694	9,733	9,783	9,810	10,200 [e]
Total	do.	10,855	10,899	10,933	10,971	11,439
Petroleum:[e]						
Crude[4]	thousand 42-gallon barrels	33,000	31,000	28,800	29,700	29,100
Refinery products[5]	do.	95,000	79,000	78,500	82,600	76,700
Uranium, U_3O_8 content[e]		90	90	106	90	90

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through February 10, 2016.

[2] In addition to the commodities listed, a variety of construction materials were produced, and antimony, asbestos, bismuth, and pyrite may have been produced; however, available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Figures converted to barrels from production in metric tons, which was reported as the following: 2010—4,490,000 (estimate); 2011—4,000,000 (estimate); 2012—3,860,000; 2013—3,984,000; and 2014—3,903,000.

[5] Figures converted to barrels from production in metric tons, which was reported as the following: 2010—12,000,000 (estimate); 2011—10,000,000 (estimate); 2012—9,883,000; 2013—10,402,000; and 2014—9,674,000.

TABLE 2
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Alum S.A. (Vimetco N.V., 86.98%)	Plant at Tulcea, Danube Delta	600
Aluminum:			
Primary	Alro S.A. (Vimetco N.V., 87.50%)	Slatina, 120 kilometers west of Bucharest	265
Secondary	Neferal S.A. (member of Metanef Group)	Bucharest	NA
Cement	Holcim (Romania) S.A. (Holcim Ltd., 99.7%)	Plants at Alesd, Campulung, and Turda	6,100
Do.	Carpatcement Holding S.A. (HeidelbergCement AG, 99%)	Plant at Bicaz, northeastern Romania	3,000
Do.	do.	Plant at Fieni, 90 kilometers northwest of Bucharest	1,500
Do.	do.	Plant at Deva, western Romania	1,500
Do.	Lafarge Ciment S.A. (Lafarge S.A., 98.56%)	Plants at Hoghiz and Medgidia	4,900
Coal:			
Bituminous	Complexul Energetic Hunedoara (Government)	7 mines located near Petrosani	3,500[e]
Lignite	Complexul Energetic Oltenia (Government)	Tismana I-II, Garla-Rovinari Est, and Pinoasa opencast mines at Rovinari	8,000[e]
Do.	do.	Rosia, Pesteana Nord, and Pesteana Sud-Udari opencast mines at Balteni	6,900[e]
Do.	do.	Udari underground mine at Udari	300[e]
Do.	do.	Jilt Sud and Jilt Nord opencast mines at Matasari	7,000[e]
Do.	do.	Dragotesti underground mine at Matasari	600[e]
Do.	do.	Lupoaia and Rosiuta opencast mines at Motru	5,000[e]
Do.	do.	Plostina, Horasti, and Lupoaia underground mines at Motru	1,600[e]
Do.	do.	Seciuri, Oltet, Berbesti-Vest, and Panga opencast mines near Berbesti	2,000[e]
Do.	do.	Albeni underground mine at Bolbocesti	555[e]
Do.	do.	Husnicioara-Vest opencast mine near Drobeta Turnu Severin	2,500[e]
Do.	do.	Zegujani underground mine about 18 kilometers northeast of Drobeta Turnu Severin	600[e]
Do.	Societatea Nationala a Carbunelui Ploiesti (Government)	8 mines located near Campulung, Baraolt City, Sarmasag, Popesti Commune, Comanesti Commune, Filipestii de Padure Commune, Sotanga Commune, and Borsec City	3,000[e]
Do.	SC Complexul Energetic Craiova SA (Ministry of Economy, 73%)	Prigaria Mine	1,000[e]
Copper, ore	S.C. Cupru Min S.A., REMIN S.A., Compania Nationala Minvest, and Moldomin S.A. (Government, 100%)	Borsa Balan, Rosia Poieni Mine; Moldova Noua	9,000
Iron ore	Compania Nationala Minvest SA (Government)	Mining complex at Hunedoara, in west-central Romania	1,320
Do.	do.	Resita Mining Complex, southwestern Romania	660
Do.	do.	Napoca-Cluj Mining Complex, northwestern Romania on the Somesul River	990
Lead:			
In ore	Compania Nationala REMIN S.A. (Government)	Baia Mare Mine, near Ukrainian and Hungarian borders	12
Do.	Compania Nationala Minvest (Government)	Vetel Mine, near Deva	5
Metal	Neferal S.A. (Member of Metanef Group)	Bucharest	25

See footnotes at end of table.

TABLE 2—Continued
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas	million cubic meters	SNGN Romgaz S.A. [Ministry of Economy, 70%; Fondul Proprietatea, 14.99%; free float (public investors), 15%]	Operated more than 150 reservoirs in Moldavia, Muntenia, and Transylvania regions	5,500 [e]
Do.	do.	S.C. OMV Petrom S.A. [OMV AG, 51.01%; Ministry of Economy, 20.64%; Property Fund S.A. (Government), 18.99%]	Approximately 239 commercial oil and gas fields located in southern and western Romania and offshore in the Black Sea	5,500 [e]
Petroleum:				
Crude		do.	do.	5,000 [e]
Refined		do.	Arpechim refinery, just south of Ploiesti	3,500
Do.		do.	Petrobrazi refinery, just south of Ploiesti	4,500
Do.		Rompetrol Rafinarie S.A. (Rompetrol Group)	Refinery at Navodari	4,500
Do.		Vega Ploiesti Refinery (Rompetrol Group)	Refinery just north of Ploiesti	500
Do.		S.C. RAFO S.A.	Refinery at Onesti	3,000 [e]
Do.		S.C. Petrotel S.A. (OAO Lukoil)	Refinery just east of Ploiesti	2,400
Do.		Astra Refinery	Refinery in Ploiesti	700
Do.		Refinaria Petrolsub Suplacu de Barcau	Refinery at Suplacu de Barcau	NA
Do.		Darmanesti refinery	Refinery at Darmanesti, eastern Romania	NA
Steel		ArcelorMittal Galati (ArcelorMittal, 99.7%)	Galati, north of Braila	6,000
Do.		ArcelorMittal Hunedoara (ArcelorMittal, 96.4%)	Hunedoara, west-central Romania, near Calan	800
Do.		S.C. Silcotub S.A. (Tenaris S.A., 100%)	Calarasi, southeastern Romania	400
Do.		S.C. TMK-Resita S.A. (OAO TMK, 100%)	Resita, southwestern Romania	450
Do.		Mechel Targoviste S.A. (Invest Nikarom SRL)	Targoviste	630 [e]
Do.		Mechel Campia Turzii S.A. (Invest Nikarom SRL)	Campia Turzii, northwestern Romania	385 [1]
Do.		Mechel Laminorul S.A. (Invest Nikarom SRL)	Braila, southeastern Romania	380
Do.		Ductil Steel S.A. (Invest Nikarom SRL)	Otelu Rosu, southwestern Romania	300 [1]
Do.		do.	Buzau, southeastern Romania	NA
Uranium, U_3O_8 content	metric tons	Compania Nationala a Uraniului (Government)	Crucea and Botusana deposits, Suceava County	110 [e]
Zinc, ore		Compania Nationala REMIN S.A. (Government)	Vetel Mine, near Deva	45

[e] Estimated. Do. do. Ditto. NA Not available.

[1] Production suspended since 2013.

THE MINERAL INDUSTRY OF RUSSIA

By Elena Safirova

In 2014, Russia was ranked among the world's leading producers or was a leading regional producer of such mineral commodities as aluminum, antimony, arsenic, asbestos, bauxite, boron, cadmium, cement, coal, cobalt, copper, diamond, diatomite, gallium, gemstones, germanium, gold, graphite, gypsum, indium, iron ore, lead, lime, magnesium compounds and metals, mica (flake, scrap, and sheet), molybdenum, natural gas, nickel, nitrogen, palladium, peat, petroleum, phosphate rock, pig iron, platinum, potash, rare earths, rhenium, selenium, silicon, silver, steel, sulfur, tellurium, titanium sponge, tungsten, uranium, vanadium, and vermiculite (BP p.l.c., 2015; Anderson, 2016a, b; Apodaca, 2016a–c; Bedinger, 2016; Bray, 2016a–d; Brininstool, 2016; Corathers, 2016; Crangle, 2016a–c; Edelstein, 2016; Fenton, 2016; Flanagan, 2016; Gambogi, 2016; George, 2016a, b; Guberman, 2016a–c; Jasinski, 2016a, b; Jaskula, 2016; Kuck, 2016; Loferski, 2016; Olson, 2016a–c; Polyak, 2016a–c; Schnebele, 2016; Shedd, 2016a, b; Tanner, 2016; Tolcin, 2016a, b; Tuck, 2016; van Oss, 2016; Willett, 2016; World Nuclear Association, 2016).

Minerals in the National Economy

In 2014, the rate of growth of Russia's real gross domestic product (GDP) was 0.6%, which was a decrease compared with the 1.3% GDP rate of growth in 2013; in 2014, the nominal GDP increased to 71.41 trillion rubles ($1.78 trillion).[1] The exchange rate of the Russian ruble to the United States dollar decreased significantly during 2014, and the nominal dollar value of the GDP decreased by 11%. Mining and quarrying contributed 6.3 trillion rubles ($157 billion), or 10.3%, to the total value added in the economy in 2014, and the total value of output from mining and quarrying in current prices was 10.29 trillion rubles ($256 billion), or 14.4% of the GDP. The value of coke and petroleum production was 7.3 trillion rubles ($182 billion), or 10.2% of the GDP, and the value of metallurgy and finished metals production was 4.57 trillion rubles ($114 billion), or 6.4% of the GDP. The value of chemical production was 2.1 trillion rubles ($52.4 billion), or 2.9% of the GDP, and the value of output of other nonmetallic mineral products was 1.25 trillion rubles ($31.3 billion), or 1.8% of the GDP (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2015).

During 2014, the value of mining and quarrying output increased by 1.4%. The value of mining and quarrying of fuel and energy products increased at a slightly slower rate (by 1.4%) than did the value of mining and quarrying of nonenergy minerals, which increased at a rate of 1.6%. Among the nonmining industrial sectors, the value of metallurgy and finished metal products increased by 0.6%; the value of the production of coke and petroleum products increased by 5.7%; and the value of chemical products increased by 0.1%. The value of output of other nonmetal mineral products decreased by 1.8% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2015).

Government Policies and Programs

In 2014, the Government of Russia used legislative, regulatory, and economic methods to stimulate the mineral sector of the economy and to manage mineral resources. In November, the Ministry of Natural Resources and Environment (Minprirody) approved a new methodology to determine the payments for natural resources. The methodology was previously approved by other relevant Government agencies. The new rates of payment would depend on the size of the license area, the type of mineral, and the economic and geographic conditions of the area where the deposit is located; the duration of work, including exploration and mining; the degree of previous exploration; the density of resources; the level of risk; and the depth of productive strata. All these factors combined would determine the so-called adjustment coefficient that varied between 0 and 1. For example, the deposits located far from transportation infrastructure and those located in Arctic deserts were assigned a coefficient of zero. The coefficient would increase every year, depending on the type of work conducted, such as exploration, assessment, construction, or exploitation of the deposit. Previously, the payment rates were determined according to the 2002 regulations, which used parameters whose values were difficult to determine at the early stages, especially during exploration, and led to highly subjective payment rates (Mineral.ru, 2014a; MinerJob.ru, 2014h).

In 2014, several important developments took place at OAO Rosgeologiya Holding Co., which was a strategic stock company that was 100% owned by the Government. Rosgeologiya was created in 2011 to streamline and increase Government participation in exploration for mineral resources; 37 Government-owned geologic exploration companies located in 30 Russian regions were consolidated under one state company, and the integration continued throughout 2014. Over the years, the geologic exploration companies of Rosgeologiya had discovered more than 1,000 deposits, including the Astrakhanskoye and the Kovykinskoye natural gas deposits, the Tengizskoye petroleum deposit, and the Sukhoy Log gold deposit (MinerJob.ru, 2014c; Prime.ru, 2014b).

In January, the Scientific and Technical Advisory Committee of Rosgeologiya discussed the general development strategy of the holding company through 2020. The strategy included a gradual increase of Rosgeologiya's market share of geologic exploration in Russia, implementation of an aggressive investment program, and consolidation of exploration assets. In May, the final version of the strategy document was approved by the Board of Directors. The first order of business was an upcoming consolidation of companies within Rosgeologiya's regions. The reorganization was expected to eliminate duplication of functions within the holding company, to prevent internal conflicts of interest, and to provide opportunities for systematic analysis and synthesis of information obtained by companies with different specializations and expertise. For example, OAO Petersburg Complex Geologic Expedition, OAO Northwest Geology, and OAO Severkvartssamotsvety were to form the Northwestern Geologic Union, which would be a new consolidated unit of Rosgeologiya. The leadership of the new unit was expected to develop a new financial and management model for the consolidation process and for the work after the reorganization (MinerJob.ru 2014c; Prime.ru, 2014b).

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[1] Where necessary, values have been converted from Russian rubles (RUB) to U.S. dollars (US$) at an annual average exchange rate of RUB40.118=US$1.00 for 2014 and RUB33.165=US$1.00 for 2013. All values are nominal, at current prices, unless otherwise stated.

In August, the Expert Committee of the Government suggested giving Rosgeologiya the status of a special agency responsible for mineral exploration on the national level and for the replenishment of the resource base of the entire country. Prior to this change, Rosgeologiya had operated on the exploration market in the same capacity as other market participants. The Expert Committee pointed out that Rosgeologiya could not be held accountable for replenishment of national resources if it continued to operate as a free-market agent that faced uncertainty and dependence on the Government's actions and changes in the country's laws. The committee stated that comprehensive regional geologic exploration in many countries was performed by government entities because such activities were not likely to result in profits. Therefore, the Expert Committee suggested that Rosgeologiya should be assigned the functions of a special agency for the development of geologic exploration and replenishment of mineral resources. The committee emphasized that the new functions of the holding company would require changes in the current laws as well as changes in the long-term investment program and the current strategy of the holding company (Mineral.ru, 2014m).

In February, the Government decided to give Rosgeologiya 100% minus one share of OAO Zarubezhgeologiya, which was a Government organization specializing in mineral exploration abroad, as payment for additional stock offerings of Rosgeologiya. In 2014, Rosgeologiya conducted negotiations for potential mineral exploration in Africa, both on land and on the continental shelf. Rosgeologiya also planned to conduct mineral exploration in South America and Southeast Asia (Mineral.ru, 2014k).

In 2014, the Government of the Russian Federation considered stimulation of the country's geologic exploration activity as one of its key functions. The Government used traditional regulation, economic incentives, and Government investment to achieve this goal. According to the Minprirody's data, in 2013, private investment in exploration reached 307.4 billion rubles (about $9.27 billion), which was a 37% increase compared with the investment in 2012. Of this amount, the investment in exploration for hydrocarbons increased by about 50%, to 268 billion rubles ($8.08 billion), and the investment in exploration for nonhydrocarbon mineral resources decreased by about 30%, to 39.4 billion rubles (about $1.19 billion). The Government announced that an increase in reserves (defined as the positive difference between new exploration and extraction) was achieved for coal, gold, iron ore, natural gas, petroleum, and uranium. Also, the Government revenue from the licensing auctions amounted to 160 billion rubles ($4.82 billion) (Mineral.ru, 2014u).

In July, Minprirody significantly simplified the process of obtaining exploration licenses for unexplored deposits; that is, the deposits for which there was no information about reserves or the P1 plus P2 resources (similar to "inferred resources" in U.S. Geological Survey terminology) as well as those that were not on the Government's lists of deposits suggested for exploration. According to the new rules, applicants for exploration and assessment licenses for nonhydrocarbon mineral resources who intended to conduct proposed work using their own funds would only need to fill out an electronic application. The requirement to include such areas on the lists for prospective exploration also was removed. According to the new rules, no applicant could apply for more than three lots, and the size of each lot could not exceed 100 square kilometers (km^2). The early results of the new rules showed a significant increase in demand for exploration licenses. As of September, applications had been submitted for about 80 licenses, including 33 for exploration for precious metals (predominantly alluvial gold), 8 for nonferrous metals, 3 for coal, and 1 for ferrous metals. According to Minprirody, only about 15 exploration license applications had been submitted during all of 2013 (Mineral.ru, 2014d, e, q).

The Government also tried to introduce economic measures to stimulate exploration. In particular, Minprirody proposed excluding expenditures on exploration from the tax on extraction of mineral resources (NDPI) and from the calculation of the basis for the tax on profits. According to the Ministry's calculations, those measures would likely increase total petroleum reserves (which would include new discoveries of petroleum) by 2 billion metric tons through 2035. These measures would also likely increase annual petroleum production by 400 million metric tons (Mt). According to Minprirody, Russian companies invested much less in mineral exploration than did companies in other countries and transnational companies, which could be explained partially by Russia's large identified reserves, which appeared to be sufficient to maintain production at current levels for decades. The lack of investment in mineral exploration, nevertheless, could risk future production and also could reduce Government revenues (Mineral.ru, 2014j).

The Government also supported exploration through investment. In 2014, the Government announced that it planned to invest at least 320 billion rubles (about $7.98 billion) in mineral exploration during the next 6 years. In 2013, the Federal Government spent about 32 billion rubles (about $965 million) on mineral exploration and planned to spend about 35 billion rubles (about $872 million) in 2014. In 2014, the Government-funded exploration for petroleum and natural gas focused on several zones in Eastern Siberia and Western Siberia and the Caspian region, which the Government considered most promising. In particular, the Government selected five zones, three of which were located in Western Siberia (the Karabashskaya, the Gydansko-Khatangskaya, and the Yugansko-Koltogorskaya zones), as well as Argishsko-Chunskaya in Eastern Siberia and Ozinsko-Altatinskaya in the Caspian geologic province. These five zones were selected from a list of 24 zones with the goal to maximize the probability for discovery of large- and medium-size deposits of petroleum and natural gas. The Government planned to spend about 65 billion rubles (about $1.6 billion) on exploration for hydrocarbon resources in these zones during the next 7 years; the plan included drilling more than 1,000 wells across a 618,000-km^2 area. At the same time, federally funded exploration would be reduced in the traditional areas of hydrocarbon production, such as Khanty-Mansiyskiy Avtonomnyy Okrug (HMAO), the Northern Caucasus, and the Povolzhye. The Government expected that exploration in these developed regions would be conducted by private companies (Mineral.ru, 2014i; Pronedra.ru, 2014g).

In 2014, Minprirody had several initiatives related to the study and development of nontraditional sources of hydrocarbons in different stages. In June, a bill on the liberalization of access to the hydrocarbon resources located in the continental shelf, which was developed by Minprirody, was approved by the legislation committee of the Government. According to the bill, the companies that received access to exploration in the continental shelf prior to adoption of the law on strategic deposits would be able to obtain extraction licenses for the deposits they discovered. As a result, the Government would eliminate the risk of loss of invested funds for the companies that invested in exploration and would create a stimulus to encourage exploration and investment in marine water areas according to "old" licenses. It was expected that, if adopted, this bill would likely affect such companies as Chernomorneftegaz, OAO Lukoil, and Severneftegaz. The bill was expected to be approved by the Government and then introduced to the Parliament (Mineral.ru, 2014t).

In 2014, the Government continued to discuss possible tax incentives for the development of shale hydrocarbons. In September 2013, the tax rate on the extraction of natural resources (the NDPI rate) from the Abalakskaya, the Bazhenovskaya, the Domanikovskaya, and the Khadumskaya Shales was set at zero for a period of between 10 and 15 years. This rate was applicable to all deposits within those shales where deposit depletion did not exceed 5%. In December 2013, the Government agreed to extend the zero NDPI rate to all deposits that are less than 10% depleted. In February 2014, Minprirody considered a suggestion to set the NDPI rate to zero for the entire Bazhenovskaya Shale, regardless of the rate of depletion of particular deposits. In addition, Minprirody considered providing tax incentives for the development of hydrocarbons from the Akhimovskaya and the Tymenskaya Shales. Also, the Ministry was considering reducing the import tariffs on equipment, which was produced outside Russia, that was used to develop of shale oil (Mineral.ru, 2014g).

In October, Minprirody announced that it was preparing a bill that would simplify access to shale hydrocarbons, particularly shale oil. It was expected that, if the bill was adopted, any interested party that was capable of cutting through shale would be able to get a license and start drilling. The companies that conducted such experiments would receive tax incentives and would not need to participate in tenders to obtain mining licenses. Minprirody planned to send the bill to the Government for consideration in the near future (Mineral.ru, 2014d, e, t).

In February, Minprirody proposed an amendment to Russia's Mining Code that was related to auctions with sole participants. The current Mining Code specifies that if an auction has only one bidder, then the auction is automatically canceled and the natural resource remains unused. In 2012 and 2013, about 1,500 auctions were held, and only about 50% had two or more bidders. Moreover, in about 500 auctions, the second company was a fictitious bidder brought in by the first bidder to assure that the auction would not be canceled. According to the Minprirody, a proposed amendment would eliminate the need for fictitious bidders and would increase the Government's revenue from the auctions. It was not clear how other ministries, such as the Ministry of Energy, would react to this proposal and whether the amendment would likely be passed by the Parliament (MinerJob.ru, 2014b; Pronedra.ru, 2014c).

In February, Minprirody announced a large-scale inspection of projects at licensed mining sites in Russia's Far East. The Ministry planned to inspect the worksites and compare the work plans used to obtain the licenses with the actual work in progress. If the work at the sites was either not being completed or was significantly delayed, the Ministry retained the right to annul the licenses. Also, the companies in the Far East that were mining nonhydrocarbon natural resources were eligible for a reduced mineral extraction tax. If, however, the companies did not satisfy the requirements of their mining licenses, then they were ineligible for the reduced tax rates. The head of Minprirody stated that about 100 mining licenses in Russia's Far East were annulled every year. The Ministry was working on revisions to regulations to address companies' responsibilities for ensuring that work specified in the license agreements is completed. In particular, Minprirody wanted to have the ability to increase companies' user tax obligations if the conditions of their licenses are not met. Overall, Russia has about 49,000 active mining licenses. Every year, about 25% of the projects are inspected; in 2013, 5,470 licensed mining projects were inspected (Mineral.ru, 2014f; Pronedra.ru, 2014d).

In September, Russia signed the Minamata Convention on the use of mercury. According to the convention, the Russian Federation agreed to stop producing articles containing mercury and its compounds by 2030. Until then, Russia would ban the use of mercury in several stages. By 2018, the country would ban the production of acetaldehyde, and by 2025, mercury would be banned from use as a catalyst in chloralkali processes. The country would also institute control over artisanal gold mining and amalgamation, which were often associated with mercury-related pollution. Mercury would be allowed to be used in medical measuring devices through 2030 (Pronedra.ru, 2014a, f).

Production

In 2014, Russia's production of mineral commodities was largely stable. Production of secondary gold increased by 102%; tin, mine output, by 92%; secondary silver production, by 38%; indium, by 30%; soda ash, by 23%; potash, by 22%; and germanium, by an estimated 20%. The output of ferrochromium silicon increased by 16%; selenium, by 15%; steel pipe, by 12%; and rolled steel, by 10%. At the same time, production of sulfur, as a byproduct of metallurgy, decreased by an estimated 33%;

sulfur, as a byproduct of petroleum and other ferroalloys, by 29%; ferrotitanium, by 27%; molybdenum, in concentrate, by an estimated 24%; ferronickel, by an estimated 15%; peat, by an estimated 13%; and sulfur from pyrites, by an estimated 10%. Production data for these and other mineral commodities are in table 1.

Structure of the Mineral Industry

At the end of 2014, Russia had 17,800 enterprises engaged in mining and quarrying, which was a 2.3% increase compared with the number of enterprises active in mining and quarrying in 2013. Of these enterprises, 6,900 were engaged in extracting fuel minerals and the other 10,900 were engaged in mining nonfuel minerals. Out of all mining and quarrying enterprises, only about 200 were owned by the Federal and municipal governments, 15,900 were owned by Russian citizens, and about 300 were either owned by foreign companies or jointly owned by domestic and foreign entities. In addition, Russia had 45,900 enterprises engaged in metallurgy, 44,100 of which were owned by Russian citizens. Information on the structure of Russia's mineral industry is in table 2 (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2015).

Mineral Trade

In 2014, the total value of Russia's exports of goods was $497.7 billion, which was a 4.9% decrease compared with the revised value of exports in 2013. The value of Russia's imports in 2014 decreased to $308.0 billion, or by 9.8%. Russia had a positive trade balance of $189.7 billion for the year (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2015).

The main export categories for Russia were chemicals, manufactured goods, metals, natural gas, petroleum and petroleum products, and wood and wood products. Mineral products made up 70.5% of the total value of Russia's exports, and crude oil alone contributed 30.9% to the total value of exports. Petroleum refinery products accounted for another 23.3%; natural gas, 11.1%; and ferrous metals, 4.1%. Among ferrous metals and products made of them, the leading categories were semifinished products made from carbon steel (32.0%) and flat-rolled iron and steel (24.9%). Other mineral products that contributed significantly to Russia's export revenue were bituminous coal (2.3%), aluminum (1.1%), nickel (0.78%), nitrogen fertilizers (0.65%), complex mineral fertilizers (0.61%), potassium fertilizers (0.54%), and ferrous ores and concentrates (0.39%). The major export partners of Russia in 2014 were the Netherlands (which received 13.7% of Russia's exports), China and Germany (7.5% each), Italy (7.2%), Turkey (5.0%), Belarus and Japan (4.0% each), Ukraine (3.4%), Poland (3.2%), and Kazakhstan (2.8%) (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2015).

In 2014, Russia imported $6.9 billion worth of products made of ferrous metals (which constituted 2.2% of the total imports) and $5.7 billion worth of ferrous metals (1.9%). The major import partners of Russia were China (which supplied 17.7% of Russia's imports), Germany (11.5%), the United States (6.5%), Italy (4.4%), Belarus (4.3%), Japan (3.8%), France and Ukraine (3.7% each), the United Kingdom (2.7%), Kazakhstan (2.6%), and Poland (2.5%) (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2015).

Commodity Review

Metals

Platinum-Group Metals.—In 2014, Russia produced an estimated 23,500 kilograms (kg) of platinum and 82,700 kg of palladium. Compared with 2013, platinum production decreased by 9.3%, but palladium production increased by 3.1% and reversed the trend of annual production decreases during the past several years. The leading producer of platinum-group metals (PGMs) in 2014 was OJSC MMC Norilsk Nickel (Nornickel), which produced most of the palladium and more than 80% of all platinum mined in Russia (OJSC MMC Norilsk Nickel, 2015).

The second leading producer of PGMs, GK Russian Platinum, had three active PGM projects. The first one was the Kondyor alluvial deposit in Khabarovskiy Kray, which is located about 1,000 kilometers north of the city of Khabarovsk. OAO A/S Amur (a subsidiary of Russian Platinum) mined about 3.7 metric tons per year (t/yr) of platinum at Kondyor. In 2014, Amur had an exploration program worth $17 million. The Yorgalan deposit, which is located near Kondyor, had estimated resources of 13 metric tons (t) of platinum. Russian Platinum planned to start platinum production at Yorgalan in 2016 and to start mining and processing platinum ore from the Kondyor deposit in the near future. In 2014 and 2015, the company planned to invest $130 million in production facilities at Kondyor (Mineral.ru, 2014o, p).

Two other Russian Platinum projects were the Chernogorskoye copper-nickel-platinum deposit (located on the Taymyr Peninsula) and the southern part of the Norilsk-1 deposit, which contained cobalt, copper, nickel, and other minerals. Norilsk-1 was one of the largest deposits on the Taymyr Peninsula, and the resources of its southern part contained 378,000 t of copper, 273,000 t of nickel, 12,700 t of cobalt, and about 518 kg of PGM (Mineral.ru, 2014n).

In February, Russian Platinum announced its intention to invest about $220 billion rubles (about $5.5 billion) in the development of two deposits in the Norilsk region—the Chernogorskoye and the southern portion of Norilsk-1—during a period of 8 to 10 years. The company announced that mining would start in 2015 and that it would build mining and beneficiation plants and mining and metallurgical plants at both deposits, construct the required energy and transportation infrastructure, and pay more than 23 billion rubles (about $570 million) in taxes. The company would also contribute to the social development of the region and build 110,000 square meters of housing and children's day care centers (MinerJob.ru, 2014g; Pronedra.ru, 2014h).

In March 2014, Russian Platinum signed an agreement with the regional administration that the Chernogorskoye Mine was to reach its design capacity by no later than October 10, 2017. The design capacity was to be at least 2.5 million metric tons per year (Mt/yr) of ore, and, according to the agreement, the company had to create at least 1,500 jobs in the region. The total measured resources of the Chernogorskoye Mine were 143 Mt, and an additional 80 Mt was forecast. In addition, Russian Platinum was to commission a mine in the southern part of the Norilsk-1 deposit by no later than August 9, 2023, and the mine was to reach its design capacity of 6 Mt/yr of ore by no later than August 9, 2024. The regional administration agreed to lease lands to Russian Platinum to build production facilities and construct a road from Norilsk to the Chernogorskoye deposit with the conditions that the Norilsk-1 project must create at least 2,000 jobs, and, by 2033, that the Chernogorskoye and the Norilsk-1 projects together must create a total of 7,000 jobs (Mineral.ru, 2014n).

At the end of March, it was announced that Nornickel won the auction for the right to lease land for construction of the road from Norilsk to the Chernogorskoye deposit. It was later reported that, although the starting bid was set at 3,300 rubles (about $82), Nornickel bid 12 million rubles (about $300,000) and won the project. The Chernogorskoye deposit is located close to the Maslovskoye deposit, the license for development of which is held by Nornickel, and Nornickel likely would save money by constructing both roads (MinerJob.ru, 2014e; Pronedra.ru, 2014e).

In April, Nornickel announced that it was ready to start developing the Maslovskoye deposit, which was located on the Taymyr Peninsula in Krasnoyarskiy Kray. Nornickel had a long history with the deposit. In 2006, Nornickel obtained an exploration license and discovered the deposit. Historically, Maslovskoye was considered to be a nickel deposit, but in the course of exploration, Nornickel discovered resources of copper, gold, and platinum. In 2009, the resources of the deposit were confirmed (in the C1 plus C2 categories—similar to the indicated and inferred resources categories, respectively, in USGS terminology) at 215 Mt containing 1.1 Mt of copper, 728,000 t of nickel, 32.26 million troy ounces of palladium, 12.4 million troy ounces of platinum, and 1.3 million troy ounces of gold. According to Russia's Law on Subsoil of 2008, the company that discovered the deposit, Nornickel, had the right to convert its exploration license automatically into a mining license. In 2009, however, a clerical error in the original exploration license resulted in an incorrect coordinate of the licensed area being recorded, which increased the licensed area from 24 km^2 to 91 km^2. The original exploration license was valid through the end of 2011, and was later renewed through the end of 2013. Although the clerical error was eventually corrected, the correction was made after the resources of the deposit were recorded, and the exploration license was not converted into a mining license automatically. Moreover, the Government questioned the legality of the deposit discovery certificate that had been given to Nornickel. Nornickel's main competitor, Russian Platinum, announced that it would participate in an auction for the Maslovskoye deposit mining license if the Government decided to hold an auction (Mineral.ru, 2014h).

In 2014, Nornickel tried to resolve the situation and to finally obtain the mining license for the Maslovskoye deposit. The company announced that it had invested 1.4 billion rubles (about $35 million) in exploration at Maslovskoye and it promised to invest 85 billion rubles (about $2.12 billion) in the development of the deposit. Unable to correct the error otherwise, Nornickel sent a letter to Russia's Prime Minister. It appeared that the Prime Minister ordered the problem corrected and the regulations corrected to avoid similar problems in the future; it was not clear when Nornickel would receive a mining license for the Maslovskoye deposit (MinerJob.ru, 2014d, f).

In 2003, Eurasia Mining plc of the United Kingdom and Anglo American Platinum (Amplats) of South Africa created a 50–50 joint venture called Urals Alluvial Platinum Ltd. (UAP) for the production of alluvial platinum in Russia. Later, the joint venture became the owner of 75% of ZAO Kos'vinskiy Kamen', and the other 25% was owned by a group of artisanal miners called Yuzhno-Zaozerskiy Priisk. ZAO Kos'vinskiy Kamen' had explored for alluvial platinum in the Tylay-Kos'vinskaya area of Western Kytlym, which is located in northern Sverdlovskaya Oblast', since 2005. In June 2014, Amplats announced that it was selling its share in the joint venture to its partner, Eurasia Mining; the value of the transaction was estimated to be between 300 million and 350 million rubles (between $7.5 million and $8.7 million). As a result, Eurasia Mining would own 100% of UAP. The company reported that, as of May 2014, its total investment in the project amounted to 240 million rubles (about $6 million). The confirmed resources of UAP in the C2 category (similar to the inferred resources category in USGS terminology) were reported to be 2,283 kg of platinum, and Eurasia Mining reported that the resources would allow the company to mine the area for about 9 years. The company planned to start mining in 2015 (Mineral.ru, 2014b, r).

In October, Polymetal International plc announced that it was considering conducting exploration for and production of PGMs, a long-term strategy for the company. It announced that it had prepared a resource assessment for its Semchenskaya area project, which is located in Kareliya, and was waiting for Government approval of the document. Polymetal obtained a license for the Semchenskaya area with a preliminary resource estimate of 130.6 t (4.2 million troy ounces) of platinoids in palladium equivalent in 2012. In May 2013, Polymetal acquired ZAO Nevyanskaya Gruppa, which had a license for exploration and production of platinoids in the Svetlobor area in Sverdlovskaya Oblast', where preliminary resources amounted to 59.1 t (1.9 million troy ounces) of PGMs. Polymetal was a Russian company engaged in the production of gold and silver and the development of precious metal projects in Russia and Kazakhstan; the company was registered in Jersey [United Kingdom] (Prime.ru, 2014a).

Titanium.—In 2014, Russia produced an estimated 47,000 t of titanium sponge, which was a 2.2% increase compared with production in 2013. Russia was the second-ranked producer of titanium sponge after China, and production was mostly from imported raw materials. The Bereznikovskiy titanium-magnesium complex (BTMK) in Permskiy Kray, which was a unit within OAO VSMPO-Avisma Corp., produced most of Russia's titanium sponge. The other titanium producer in Russia, the OAO Solikamskiy magnesium plant, produced much less titanium than the BTMK. Both plants supplied titanium sponge to another unit of VSMPO-Avisma—the Verkhnesaldinskoye metallurgical production complex, which was located in Sverdlovskaya Oblast; this unit produced titanium mill products and semifinished products made from titanium alloys. Russia was the world leader in the production and export of titanium products (Mineral-Info, 2015).

In 2014, the Verkhnesaldinskoye complex produced 29,260 t of titanium products, which was 1.4% more than in 2013. VSMPO-Avisma supplied titanium mill products to major world companies involved in building aircraft. It was also the only supplier of titanium metal to the Russian domestic market. In 2014, the net profit of VSMPO-Avisma was reduced by 46% to 4.02 billion rubles (about $100 million) owing to the negative impact of the exchange rate of the Russian ruble to other currencies, in particular the euro area euro and the United States dollar. In 2014, VSMPO-Avisma employed a total of 20,200 people, which was 290 fewer people than in 2013. In 2014, the company invested 5.1 billion rubles (about $127 million) in its production, which was 0.7% more than in 2013. The company was one of the largest taxpayers in the Sverdlovskaya Oblast' and paid a total of 5.6 billion rubles (about $139.3 million) in taxes to government entities at various levels (Mineral.ru, 2015).

In 2014, VSMPO-Avisma's supply of materials for titanium production was interrupted several times. In November, one of OAO Uralkali's mines was flooded and created the risk of flooding at the company's neighboring mines, including the only Uralkali mine that produced carnallite. Carnallite is a material used by VSMPO-Avisma in the production of magnesium products, which are used in titanium production. In 2013, Uralkali produced 315,000 t of carnallite and was modernizing its operation to increase its production capacity to 400,000 t/yr. The company reported that, if shortages of carnallite occur, it could either find an alternative supplier or change the production technology such as, for example, to one that uses liquid chlorine instead of carnallite. In 2006, VSMPO-Avisma faced a shortage of carnallite and was able to purchase the material from a supplier in Israel (Interfax.ru, 2014b; Pronedra.ru, 2014b).

Another supply problem was related to shipments of ilmenite concentrate from Ukraine. Historically, Ukraine has been the main source of ilmenite for VSMPO-Avisma. In 2012 and 2013, Russia imported 111,200 t and 119,300 t of ilmenite, respectively, from Ukraine, and in 2014, imports from Ukraine were reduced to 93,300 t. All shipments were made from the Irshanskiy and the Vol'nogorkiy mining and beneficiation complexes (GOKs). In September, the Government of Ukraine nationalized the Irshanskiy and the Vol'nogorskiy GOKs, which had previously been owned by the DF Group. In order to protect itself against the risk of supply loss, VSMPO-Avisma decided to diversify its supply of raw materials and purchased 5,300 t of ilmenite concentrate from Senegal. The ilmenite concentrate from Senegal contained 54% titanium oxide (TiO_2) and cost $326 per metric ton, whereas the ilmenite concentrate from Ukraine contained 63% TiO_2 and cost $370 per metric ton. In 2014, VSMPO-Avisma also purchased titanium raw materials (mostly rutile) from Australia, Sierra-Leone, South Africa, and Thailand. The prices of 95% rutile concentrate from those countries were reported to be $1,257, $1,062, $1,602, and $1,641, respectively. Despite the higher prices, the Russian company wanted to minimize the risk of supply disruptions related to the political situation in Ukraine. In November 2014, VSMPO-Avisma assured its business partners that it had sufficient inventory of titanium raw materials to continue production for between 8 and 10 months (Izvestia.ru, 2014; Steelland.ru, 2014).

In May, VSMPO-Avisma and Government officials in Dnepropetrovskaya Oblast' in Ukraine agreed to continue developing the Volchanskoye titanium-zirconium deposit. The Demurinskiy GOK (a subsidiary of VSMPO-Avisma in Ukraine) planned to set up industrial-scale mining at the site. Earlier, in March, the Economic Court of Dnepropetrovskaya Oblast' ruled that the lease agreement on which the project was based violated Ukrainian law by illegally leasing agricultural land for the mining project. Consequently, the court annulled the lease agreement and precluded development of the mining project. In May, VSMPO-Avisma signed a new land lease for the Volchanskoye deposit. The comprehensive agreement required the company to invest $45 million in the development of the deposit, to create 200 new jobs at the GOK, and to contribute to local social programs. VSMPO-Avisma planned to move from the pilot stage to the full-scale production stage. The projected capacity of the Demurinskiy GOK was 40 t/yr and full-scale production was expected to start in 2016 (Steelland.ru, 2014; Yarosh, 2014).

VSMPO-Avisma had held a license for the Tsentral'noye titanium-zirconium deposit in Tambovskaya Oblast' in Russia since 2011. Development of the deposit could provide the company with titanium raw materials for several decades. VSMPO-Avisma planned to begin mining the Tsentral'noye deposit in 2016. It was not clear if the company had planned to accelerate the development of the deposit owing to the risks associated with the supply of titanium raw materials from Ukraine (Yarosh, 2014).

The Tuganskiy mining and beneficiation complex "Ilmenit" (TGOK) and Izurium Capital of the United Kingdom, an investment fund, planned to build a mining and beneficiation plant with the capacity to process 4 Mt/yr of mineral sands in the Tomskaya Oblast'. TGOK was founded in 2002, and in 2005, a pilot production line with an annual capacity of 125,000 t/yr of quartz sands was commissioned. Total investment in the project was expected to amount to $132 million. The project was to be implemented in three stages—the pilot project and two full production stages. At each of the full production stages, the plant would have the capacity to process 2 Mt/yr of mineral sands. The complex was expected to be commissioned in 2016 and would reach full capacity in 2018. The mining and beneficiation plant would produce 13,300 t/yr of rutile and leucoxene concentrate, 33,500 t/yr of zircon concentrate, 73,100 t/yr of ilmenite concentrate, and 960,000 t/yr of quartz sands. TGOK planned to become the second-ranked supplier of products made of beneficiated mineral sands in Siberia, with a market share of about 15% in raw materials for titanium production and 30% in zirconium, and the leading supplier of sands for glassmaking in Siberia, with a market share of about 50% (MinerJob.ru, 2014a).

Industrial Minerals

Cement.—According to the Federal State Statistical Service, Russia produced a total of 68,544,800 t of cement in 2014, which was a 3.1% increase compared with that of 2013.

The largest increases in cement production took place in the Privolzhskiy Federal Okrug (an increase of 1.9 Mt, or 13.2%) and the Central Federal Okrug (0.55 Mt, or 3.2%). The increases were largely attributable to the commissioning of new production facilities, such as OAO Serebryakovcement and Sengileevskiy Cement, and new plants, such as the Lafarge plant in Kaluzhskaya Oblast' and OOO Asia Cement in Penzenskaya Oblast'. At the same time, production in three Federal Okrugs—the Northwestern, The Ural'skiy, and the Northern Caucasus—decreased by 449,000 t, 364,000 t, and 300,000 t, respectively. In 2014, the trend of relative increase of portland cement without additives continued, and for the first time, the share of Portland cement without additives (48.1%) exceeded the share of portland cement with additives (45.8%). The leading cement-producing company in Russia was Eurocement, which controlled 29.4% of all cement production, followed by Novoroscement (8.8%), Mordovcement (7.3%), Siberian Cement (6.6%), Dyckerhoff (6.0%), HeidelbergCement Russia (5.6%), and Holcim Russia (5.4%). In 2014, Russia had a total of about 70 cement plants with annual capacities ranging from 100,000 t/yr to more than 4 Mt/yr (Cemclub.ru, 2015; Nezavisimyi Stroitel'nyi Portal, 2016).

In 2014, Russia imported 5.2 Mt of cement, which was a 3.4% decrease compared with the amount imported in 2013. The leading exporter of cement to Russia was Belarus, which supplied 1.59 Mt of cement, or 30.6% of total imports. Significant cement imports were received from Iran (12.5% of the total), Turkey (11.0%), Sweden (8.9%), Latvia (6.8%), and Kazakhstan (6.0%). In 2014, Russia's cement plants exported a total of 2.4 Mt of cement, which was a 20.3% reduction compared with 2013. The main importers of Russia's cement were Kazakhstan, which received 36.9%, Ukraine (28.9%), Belarus (25.2%), and Azerbaijan (7.6%). Russia's apparent cement consumption in 2014 was 71.3 Mt, which constituted a 3.8% increase compared with that of 2013. In 2014, new housing construction reached 83 million square meters, which absorbed the additional cement production (Cemclub.ru, 2015; Rcmm.ru, 2015).

Rare Earths.—In 2014, Russia produced an estimated 1,400 t of total rare-earth oxides. The only producer of rare earths in Russia was the Lovozerskiy GOK (located in Murmanskaya Oblast'), where production had been decreasing slowly during the past several years. At the same time, Russia had significant resources of rare earths and planned to start rare-earth production in various parts of the country (table 1).

In January, the Ministry of Industry and Trade (Minpromtorg) developed a program to subsidize interest rates for investment projects involving rare metals and rare-earth metals from 2014 through 2016. The total amount of the subsidies approved by the Government was 735.2 million rubles (about $18.3 million). Of that total, 11.2 million rubles (about $279,200) would be spent on subsidies in 2014; 133.3 million rubles (about $3.32 million), in 2015; and the remaining 590.8 million rubles (about $14.7 million), in 2016. Minpromtorg also developed the second stage of the subsidy project for the period between 2017 and 2020, which was expected to provide total subsidies to rare-earth metal producers in the amount of 14.3 billion rubles (about $356.4 million). The subsidy was part of a comprehensive Government program entitled "Development of the rare metal and rare-earth industry"; the program sought to create a competitive rare metals and rare-earth metal sector with a complete technological cycle to satisfy the needs of the defense sector, civil industries, and exports. Minpromtorg planned to conduct competitions at least once per year to select companies that would receive Government support. Overall, the Government expected that the total investment in rare metals and rare-earth metals through 2020 would amount to 145 billion rubles (about $3.61 billion), including Government investments of 23.5 billion rubles (about $586 million). Minpromtorg estimated that, by 2020, Russia would produce about 20,000 t of raw materials and finished products and that production would continue to increase by between 10% to 20% per year for the foreseeable future (Mineral.ru, 2014l).

In September, the Physics and Technology Institute of the Urals Federal University announced that it had received a grant from the Government in the amount of 300 million rubles (about $7.47 million) to extract rare metals and rare-earth metals from uranium ore, specifically europium, lanthanum, and terbium. As of the end of 2014, the Institute had produced about 100 t of rare metals and rare-earth metals and planned to increase production to 1,000 t/yr of rare metals and rare-earth metals (Mineral.ru, 2014s).

In 2014, ZAO Technoinvest Alliance continued working on the construction of a mining and beneficiation plant at the Zashikhinskoye rare-earths deposit in Irkutskaya Oblast' (Zashikhinskiy GOK). The company obtained a license for developing the deposit in 2005 and had been working on the project since then. The resources of the Zashikhinskoye deposit were estimated to be 34.5 Mt containing 105,000 t of niobium pentoxide (Nb_2O_5) and 8,500 t of tantalum pentoxide (Ta_2O_5). The capacity of the Zashikhinskiy GOK was projected to be 1 Mt/yr of processed ore that would yield 3,200 t/yr of concentrate. From this amount of concentrate, the company planned to produce 166 t of Ta_2O_5 and 1,671 t of Nb_2O_5 with 99.5% metal content. The total investment in the project was estimated to be 12.9 billion rubles (about $322 million) and was funded by the company's owners, bank loans, and Government subsidies. The financing provided by Mintorg amounted to 65 million rubles ($1.62 million) in 2014. In addition to the production facilities, the company planned to build a 170-km-long road and a 110-kilowatt powerline. The company planned to commission the plant in 2018 and to reach full production capacity by 2019. Previously, the company had planned to commission the plant in 2014, but had to delay the commissioning because of difficulties with the technological decisionmaking related to the ore beneficiation methods. When operating at full capacity, the plant would provide about 300 jobs (Kommersant.ru, 2015).

The Association of National Producers of Strategic Materials proposed organizing an Eastern Rare Earth Cluster, which would be formed around the Zabaikal'skiy GOK and would use the resources of the Yermakovskoye fluorite-beryllium deposit, the Zashikhinskoye tantalum-niobium deposit, the Etykinskoye tantalum-niobium-tin deposit, and the Zavitinskoye lithium deposit. The creation of the cluster would entail reviving production at the Zabaikal'skiy GOK and organization of tolling-based shipments to the Ulba metallurgical plant in Kazakhstan. The Association recommended organizing the cluster within 2 years (Interfax.ru, 2014a; MinerJob.ru, 2014i).

In February, the Prime Minister of the Russian Federation signed a decree concerning an auction for the use of the "Burannyi" section of the Tomtorskoye rare-earths deposit in Yakutiya. The license would allow for exploration and production of niobium, rare earths, scandium, and other components. The Burannyi section covered an area of 12.4 km^2. The starting bid that was structured as a one-time fee was 956 million rubles (about $23.8 million) (Mineral.ru, 2014c).

Mineral Fuels and Related Materials

Coal.—In 2014, Russia produced 356.9 Mt of coal, which was a 1.5% increase compared with production in 2013. Anthracite coal production increased by 5.5% to 13.5 Mt, bituminous coal output increased by 3.5% to 274.5 Mt, and lignite production decreased by 6.5% to 68.9 Mt. Open pit mining was used for the production of 251.8 Mt of coal, or about 70.6%. In 2014, investment in the Russian coal industry decreased by 28% compared with that of 2013, to 58 billion rubles (about $1.45 billion). In 2014, Russia exported 152.1 Mt of bituminous coal, which was an increase of 8% compared with exports in 2013, although in terms of value, the revenue from coal exports decreased by 2% to $11.6 billion owing to a decrease in coal prices in 2014. China and the United Kingdom were the leading importers of Russia's coal and received 25.8 Mt and 24.0 Mt, respectively. Other leading importers were the Republic of Korea and Japan, which received 16.2 Mt and 14.7 Mt, respectively (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015; Vedomosti.ru, 2015).

Russia had coal reserves of 157 billion metric tons (17.6% of the world's reserves) and was second only to the United States, which held 26.6% of the world's coal reserves. Within Russia, "explored" coal resources were located in 22 coal basins and 129 separate deposits. More than two-thirds of explored coal resources were concentrated in two basins—the Kansko-Achinskiy basin, which holds 40.7% of Russia's resources, and the Kuznetskiy basin (27.4%). The Kuznetskiy basin continued to be the leading source for coal production—in 2014, 59% of Russia's coal output was produced there. In 2014, 85% of all coal mined in Russia was produced in three jurisdictions—Kemerovskaya Oblast', Krasnoyarskiy Kray, and Zabaikal'skiy Kray—in the Siberian Federal Okrug (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

Large producers dominated Russia's coal industry. The leading coal producer was OAO SUEK, which produced 98.9 Mt of coal, or 28% of the country's output, followed by OAO UK Kuzbassrazrezugol (43.5 Mt), OAO HK SDS-Ugol (29.7 Mt), Evraz (21.8 Mt), and OAO Mechel-Mining (21.4 Mt). Together, these five companies produced more than 60% of Russia's coal. The remaining output was produced by about 20 smaller companies (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

Natural Gas.—In 2014, Russia produced 643 billion cubic meters of natural gas, which was a decrease of 3.7% compared with production in 2013. Russia's share of the world production had been decreasing slowly since 2000 owing to increased production in other countries; in particular, Iran, Qatar, and the United States. In 2014, Russia produced about 19% of the world's natural gas output (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

As of January 1, 2014, Russia's resources of natural gas (categories A, B, and C1—similar to measured reserves in USGS terminology) were 49.5 trillion cubic meters, which was 1% higher than at the beginning of 2013. The largest natural gas deposits in Russia are located in the oil and gas province of Western Siberia. According to Minprirody, the leading natural gas deposit in Russia was the Urengoyskoye deposit, which had reserves of 5.2 trillion cubic meters. The Urengoyskoye deposit was followed by the Bovanenkovskoye (4.3 trillion cubic meters), the Shtokmanovskoye (3.9 trillion cubic meters), the Yamburgskoye (3.2 trillion cubic meters), and the Astrakhanskoye and Zapolyarnoye (2.5 trillion cubic meters each) (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

About 80% of the natural gas production in Russia took place in the Nadym-Pur-Taz region of the Yamalo-Nenetskiy Avtonomnyy Okrug (YaNAO). In 2013 (the latest year for which information was available), the three deposits (the Zapolyarnoye, the Urengoyskoye, and the Yamburgskoye) provided 40% of the total natural gas production in Russia, having produced 117.5, 90.6, and 75.3 billion cubic meters, respectively. Production at the Bovanenkovskoye deposit started in 2012 and reached 22.8 billion cubic meters in 2013; the deposit was expected to become one of the largest deposits in terms of annual production (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

In 2014, 67.5% of total natural gas output was produced by OAO Gazprom. Although Gazprom continued to be the dominant producer, the share of independent companies engaged in gas production continued to increase. (In 2007, only 16% of natural gas was produced by independent companies.) Among the independent companies, the production leader was Novatek, which produced 53.5 billion cubic meters, followed by Rosneft' (37.3 billion cubic meters), OAO Lukoil (18.7 billion cubic meters), TNK–BP (12.6 billion cubic meters), and Surgutneftegaz (9.4 billion cubic meters) (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

In 2014, Russia's exports of natural gas decreased by 11.4% to 187 billion cubic meters and reached the lowest level since 2000 (except for the crisis year of 2009). In 2014, the geography of gas exports remained largely stable; the major export partners of Russia were European countries. The leading export partner was Germany, which imported 36.4 billion cubic meters of natural gas from Russia, followed by Turkey (27.3 billion cubic meters), Belarus (20.1 billion cubic meters), Italy (19.9 billion cubic meters), Ukraine (14.5 billion cubic meters), Japan (11.6 billion cubic meters), Kazakhstan (8.6 billion cubic meters), and France (7.1 billion cubic meters). Compared with 2013, the largest decreases in natural gas exports were to Ukraine (decreased by 44%) and Italy (19%). In 2014, 7.7% of all Russia's natural gas exports went to countries in Asia. In 2009, when the new liquefied natural gas (LNG) plant opened on Sakhalin island, shipments of natural gas to the countries of the Asia and the Pacific region increased. As of 2014, most shipments of LNG went to Japan (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

Petroleum.—In 2014, Russia produced 526 Mt of petroleum, which was a 0.8% increase compared with production in 2013. In 2014, Russia produced about 12% of the world's output and was the third-ranked producer in the world after the United States and Saudi Arabia. Rosneft' was the leading petroleum producer in the country, accounting for 190.9 Mt, or 36.3%, of Russia's petroleum production, followed by OAO Lukoil (86.6 Mt, or 16.5%), Surgutneftegaz (61.4 Mt, or 11.7%), Gazprom Neft' (33.6 Mt, or 6.4%), Tatneft' (26.5 Mt, or 5.0%), Bashneft' (17.9 Mt, or 3.4%), and Russneft' (8.6 Mt, or 1.6%). Russia's share of world petroleum consumption continued to remain quite modest (less than 4%), but its share had continued to increase slowly during the past several years (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

In 2014, Russia refined 295 Mt of petroleum, which was a 5.0% increase compared with that of 2013. During the past 5 years, petroleum refining in Russia was slowly but steadily increasing—by 12.9% since 2010. The average depth of refining (the measure of refinery effectiveness computed as a percentage of refined petroleum products to the total volume of processed petroleum) in 2014 was 72.4% compared with 71.7% in 2013. The increase in the depth of refining was attributed to modernization at Russia's refineries, which was expected to be completed by 2020. In 2014, production of refinery products in Russia increased by 6.5 Mt (or 3.4%). The increases took place predominantly in the production of diesel fuel (an increase of 5.4 Mt, or 7.6%). At the same time, production of gasoline decreased by 0.4 Mt, or by 1.1% (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

In 2014, Russia exported 223.4 Mt of crude oil. Crude oil exports had continued to decrease during the past several years and amounted to a total decrease of 21.4 Mt compared with exports in 2009. On the other hand, exports of refined petroleum products continued to increase and, in 2014, reached 164.8 Mt, which was an increase of 13.2 Mt compared with exports in 2013. In 2014, 89.2% of crude oil and 94.1% of petroleum products were exported to countries outside the Commonwealth of Independent States (CIS) (Analiticheskiy Tsentr pri Pravitel'stve Rossiyskoy Federatsii, 2015).

Outlook

Russia has large reserves of a variety of mineral commodities and most likely will continue to be one of the world's leading mineral producers. In 2014, the country's mineral sector demonstrated several interesting trends. First, the Government and industry were very concerned about minerals exploration in the country. This trend was observed both at the level of the Federal Government and through the activities of leading mineral producers, such as Nornickel, United Company RUSAL, and VSMPO-Avisma. Second, the emphasis on exploration and national self-sufficiency was strengthened by the sanctions imposed on selected enterprises and individuals by the Western countries. For example, the program focused on domestic production of rare earths was largely based on concerns that an opportunity to import of such materials for domestic use should not be taken for granted. Finally, Russia's mineral industry began strengthening partnerships with its Eastern neighbors, such as China, at the expense of other countries and regions, such as Australia and countries of Europe.

In the short to medium run, Russia is likely to deal with the effects of reduced petroleum prices, decreased value of the ruble against other currencies, and economic sanctions. It is likely that some of the most ambitious mineral industry projects would be canceled or delayed until better economic conditions prevail in the country. It remains to be seen, however, how this new economic reality is likely to affect the structure and resilience of Russia's mineral industry.

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TABLE 1

RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Ore and concentrate:						
Alumina	thousand metric tons	2,930	2,825	2,719	2,659 [r]	2,600
Bauxite		5,688,000	5,943,000	5,700,000	5,617,000 [r]	5,500,000
Nepheline ores		4,601 [r]	4,345 [r]	4,091 [r]	3,393 [r]	3,300 [e]
Metal, smelter, primary		3,947,000	3,992,000	4,024,000	3,601,000	3,300,000
Antimony, mine output, recoverable Sb content[e]		6,040	6,348	7,300	8,700	9,000
Bismuth:[e]						
Mine output, Bi content		50	50	40	40	40
Metal, refined		10	10	8	8	8
Cadmium, metal, smelter		733	800	850 [e]	850 [e]	860 [e]
Chromium, chrome ore, marketable		699,000	662,000	552,000 [3]	360,000 [r]	360,000
Cobalt:[e]						
Mine output, recoverable Co content		6,200	6,100	6,300	6,350	6,300
Metal, refined		2,460	2,337 [3]	2,186 [3]	2,368 [3]	2,200
Copper:						
Ore, recoverable Cu content[e]		703,000	856,200 [3]	841,800 [3]	870,100 [r, 3]	860,000
Metal:						
Blister, smelter:[e]						
Primary		590,000	596,490 [3]	621,200 [3]	625,000	650,000
Secondary		240,000	242,640 [3]	253,800 [3]	255,000	230,000
Total		830,000	839,130 [3]	875,000 [3]	880,000	880,000
Refined:						
Primary		656,000	663,200	665,000	657,600	667,000
Secondary		218,000	220,400	222,400	220,000	225,000
Total		874,000	883,600	887,400	877,600	892,000
Gallium[e]		11	11	10	10	10
Germanium[e]		5 [3]	5	5	5	6
Gold:						
Mine output, Au content	kilograms	189,000	199,650	217,800	231,700 [r]	246,900
Secondary recovery	do.	12,600	9,334	8,500	17,764	35,800
Indium[e]		4	13	13	33 [r]	43
Iron and steel:						
Iron ore:						
Gross weight		95,927,200 [r, 3]	103,607,300 [r]	104,010,000 [r]	102,156,500 [r]	102,018,500
Fe content, 55% to 63%[e]		56,600,000	61,100,000 [r]	61,400,000	60,300,000 [r]	60,200,000
Metal:						
Pig iron		48,090,000	47,996,000	50,459,000	49,945,000	51,371,800
Direct-reduced iron[e]		4,700,000	4,900,000	5,200,000	5,400,000	5,400,000
Ferroalloys:						
Blast furnace:[e]						
Ferromanganese		174,800 [3]	148,100 [3]	160,800 [3]	181,400 [3]	178,600 [3]
Ferrophosphorus		3,600	3,600	3,600	3,500	3,500
Spiegeleisen		5,500	6,000	6,000	5,500	5,400
Electric furnace:						
Ferrochromium		607,570	565,900	546,360	487,810	439,600
Ferrochromiumsilicon		102,120	49,740	57,450	58,130	67,160
Ferronickel, gross weight:[4]						
High-nickel		19,763	20,200	23,300 [e]	20,000	17,000
Other		13,165	13,800	13,000 [e]	13,000	11,000
Ferroniobium (ferrocolumbium)		700	700	700	600	600
Ferrosilicon		920,440	1,026,170	1,036,930	1,012,740 [e]	1,026,190

See footnotes at end of table.

TABLE 1—Continued
RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS—Continued						
Iron and steel—Continued:						
Metal—Continued:						
Ferroalloys—Continued:[e]						
Electric furnace—Continued:						
Ferrovanadium[3]		7,000	7,590	8,280	10,510	11,380
Silicomanganese[3]		148,470	149,850	164,350	169,190	179,910
Silicon metal		48,700	52,000	52,000	50,000	50,000
Ferrotitanium		7,000	7,000	7,500	5,500 [r]	4,000
Other		7,000 [r]	8,000 [r]	9,000 [r, 3]	8,500	6,000
Total, ferroalloys		2,070,000	2,060,000	2,090,000 [3]	2,030,000	2,000,000
Steel:						
Crude		66,844,000	68,114,000	70,392,000	68,862,000	70,500,000
Finished, rolled		55,031,000	56,492,000	60,036,000	59,161,000	65,200,000
Pipe		9,190,000	9,979,000	9,723,000	10,082,000	11,300,000
Lead:[e]						
Mine output, recoverable Pb content		97,000	94,500	195,600 [r, 3]	223,300 [r, 3]	225,000
Metal, refined, primary and secondary		122,000	115,000	110,000 [3]	95,400 [3]	90,000
Magnesium:						
Magnesite[e]		1,200,000	1,200,000	1,300,000	1,300,000	1,300,000
Metal, including secondary		20,800 [r]	17,700 [r]	18,500 [r]	18,100 [r]	17,700
Manganese ore, marketable:[e]						
Gross weight		45,000	30,000	22,000 [3]	20,000	--
Mn content		9,200	4,500	3,256 [3]	3,000	--
Molybdenum, in concentrate		5,777 [r]	6,014 [r]	4,939 [r]	4,753	3,600 [e]
Nickel:						
Marketable mine production, Ni content:						
Laterite ore		41,184	34,000	37,700	35,000	32,000 [e]
Sulfide concentrate		228,093	231,000	216,400	215,000	220,000 [e]
Total		269,277	265,000	254,100	250,000	252,000 [e]
Matte		85	65	1 [e]	--	--
Nickel products:						
Metal		262,400	264,900	255,000	241,800 [r]	240,000 [e]
Chemicals[e]		2,900	2,900	2,900	2,600	2,700
Total		265,300	267,800	257,900	244,400	242,700
Platinum-group metals:						
Platinum	kilograms	25,700	27,300	26,500	25,200 [r]	23,500 [e]
Palladium	do.	84,700	84,100	81,700	80,200 [r]	82,700
Other	do.	46,500	46,000	45,200	48,800 [r]	48,500 [e]
Total	do.	156,900	157,400	153,400	154,200 [r]	154,700
Selenium	do.	110,000 [r]	100,000 [r]	114,620 [r]	114,160 [r]	130,810
Silicon[e]		1,000,000	1,031,000 [3]	1,043,000 [3]	1,100,000	1,100,000
Silver:						
Mine output, Ag content	kilograms	1,885,000 [r]	2,004,000 [r]	2,255,000 [r]	2,175,600 [r]	2,100,000 [e]
Secondary recovery	do.	40,810	39,300	40,000	150,000 [e, r]	207,500
Tellurium		31,000	30,000	30,390	31,030	32,540
Tin:[e]						
Mine output, recoverable Sn content		144 [3]	75 [3]	249 [3]	156 [3]	300 [3]
Metal, smelter:						
Primary		1,081 [3]	526 [3]	650	--	--
Secondary		300	200	250	--	--
Total		1,400	700	900	--	--

See footnotes at end of table.

TABLE 1—Continued
RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS—Continued						
Titanium sponge		26,500	24,600	42,000	46,000	47,000 [e]
Tungsten, concentrate, W content		2,785	3,314	3,025	2,973 [r]	2,800 [e]
Vanadium, metal[e]		15,000	12,860 [3]	14,856 [3]	15,000	15,000
Zinc:						
Mine output, recoverable Zn content		186,900	176,300	179,800	248,300 [r]	250,000
Metal, smelter, primary and secondary		248,600	255,600	250,000	216,000 [r]	223,311
Zirconium, baddeleyite concentrate, averaging 98% ZrO_2		9,308	8,914	7,969	8,504 [r]	8,500 [e]
INDUSTRIAL MINERALS						
Asbestos, grades I through VI		995,174	1,031,880	1,050,000 [e]	1,100,000	1,100,000 [e]
Barite[e]		60,000	63,000	63,000	225,000 [r]	215,000
Boron[e]		200,000	200,000	250,000	76,199 [r]	81,234
Cement, hydraulic		50,400,000	56,200,000	61,700,000	66,503,000	68,544,800
Clays:						
Bentonite		500,000	500,000	550,000	550,000 [e]	560,000 [e]
Kaolin and kaolinitic clays		105,000	297,000 [r]	283,000 [r]	711,000 [r]	779,000
Diamond:[e]						
Gem	carats	17,800,000	20,140,000	19,900,000	20,000,000	19,200,000
Industrial	do.	15,000,000	15,000,000	15,000,000	16,000,000	17,100,000
Synthetic	do.	80,000,000	80,000,000	80,000,000	80,000,000	NA
Total	do.	113,000,000	115,000,000	115,000,000	116,000,000	36,300,000
Diatomite		32,000	33,000	70,000	70,000	72,000 [e]
Feldspar[e]		405,000 [r]	400,000 [r]	400,000 [r]	390,000 [r]	400,000
Fluorspar, concentrate, 55% to 96.4% CaF_2		67,000	119,800	129,000	30,000 [e]	--
Graphite		14,000	15,000 [r]	14,000	15,000	15,000 [e]
Gypsum[5]		3,349,000	3,907,000	4,179,000	4,223,000	4,400,000
Iodine[e]		230,000	210,000	100,000 [r]	-- [r]	--
Lime, industrial and construction[e]		9,500,000	10,100,000	10,800,000	10,902,000	10,900,000
Limestone		7,000,000 [e]	7,000,000 [e]	7,200,000	56,700,000 [r]	58,707,400
Mica[e]		100,000	100,000	100,000	50,000 [r]	10,000
Nitrogen, N content of ammonia		10,902,000	11,418,000	11,345,000	11,836,000	12,000,000
Phosphate rock:[e]						
Gross weight		11,000,000	11,000,000	12,500,000	12,500,000	12,500,000
P_2O_5 content		4,000,000	4,000,000	4,500,000	4,500,000	4,500,000
Potash, marketable, K_2O equivalent		6,283,000	6,498,000	5,563,000	6,100,000	7,439,000
Rare earths, total rare-earth oxides		2,300	2,500	2,100	1,400 [3]	1,400 [e]
Salt, all types		1,800,000	1,800,000	1,850,000	1,900,000	1,900,000
Soda ash		2,670,000	2,822,000	2,807,000	2,477,000	3,052,000
Soda, caustic		1,075,000	1,049,000	1,093,000	1,056,000	1,076,000
Sulfur:[e]						
Native[3]		77,700	68,600	68,900	123,000	120,000 [e]
Pyrite		200,000	200,000	200,000	200,000	180,000
Byproduct:						
From metallurgy		100,000	200,000	300,000	300,000	200,000
From natural gas[3]		6,337,000	6,488,000	6,416,000	5,977,000	5,859,000
From petroleum		600,000	600,000	700,000	700,000	500,000
Total		7,310,000	7,560,000	7,680,000	7,300,000	6,860,000
Sulfur, sulfuric acid		10,200,000	10,700,000	11,036,000	10,298,000	10,200,000
Vermiculite		21,000 [r]	21,000 [r]	21,800 [r]	20,931 [r]	21,000 [e]

See footnotes at end of table.

TABLE 1—Continued

RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	8,700	10,000	11,400	12,800	13,500
Bituminous	do.	236,100	249,100	276,500	265,200	274,500
Lignite	do.	76,800	76,900	78,100 [r]	73,700 [r]	68,900
Total	do.	321,600	336,000	366,000 [r]	351,700 [r]	356,900
Coke, metallurgical, 6% moisture content	do.	26,800	26,800	26,900	25,900	26,500
Natural gas, marketed	million cubic meters	651,000	671,000	655,000	668,000 [r]	643,000
Peat, horticultural and fuel uses[e]		1,258,000 [3]	1,337,000 [3]	1,200,000	1,500,000	1,300,000
Petroleum:						
Crude:						
In gravimetric units		506,000,000	512,000,000	519,000,000	522,000,000	526,000,000
In volumetric units[e]	thousand 42-gallon barrels	3,530,000	3,578,000 [3]	3,615,000 [3]	3,636,000	3,735,000
Refinery products:						
In gravimetric units		250,000,000	258,000,000	272,000,000	281,000,000	295,000,000
In volumetric units[e]	thousand 42-gallon barrels	2,010,000	2,080,600 [3]	2,185,500 [3]	2,258,000	2,371,000
Uranium:						
U content		3,562	2,993	2,862	3,135 [r]	2,991
U_3O_8 content		4,200	3,502	3,348	3,668 [r]	3,500

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through February 16, 2016.

[2] In addition to the commodities listed, Russia produced a number of other mineral commodities, which include arsenic, lithium, mercury, niobium, oil shale, rhenium, scandium, talc, tantalum, titanium ore, and vanadium ore, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Excludes nickel-chromium remelt alloy produced from scrap. The remelt alloy typically has a nickel content of 20% to 50%.

[5] Excludes gypsum used in cement production.

TABLE 2
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina		Achinsk (United Company RUSAL)	Achinsk in East Siberia	900,000
Do.		Bogoslovsk (United Company RUSAL)	Krasnotur'insk	1,050,000
Do.		Boksitogorsk (United Company RUSAL)	Leningradskaya Oblast'	200,000
Do.		Pikalyovo (United Company RUSAL)	Pikalyovo	300,000
Do.		Uralsk (United Company RUSAL)	Kamensk-Uralskiy	700,000
Aluminum, primary smelters		Bogoslovskiy AZ (United Company RUSAL)	Krasnotur'insk	175,000
Do.		Bratskiy AZ (United Company RUSAL)	Bratsk	1,000,000
Do.		Irkutskiy AZ (United Company RUSAL)	Irkutskaya Oblast'	420,000
Do.		Kandalakskiy AZ (United Company RUSAL)	Kola Peninsula	75,000
Do.		Khakasskiy AZ (United Company RUSAL)	Khakasiya	300,000
Do.		Krasnoyarskiy AZ (United Company RUSAL)	Krasnoyarskiy Kray	1,000,000
Do.		Nadvoitskiy AZ (United Company RUSAL)	Nadvoitsy, Kareliya Republic	75,000
Do.		Novokuznetskiy AZ (United Company RUSAL)	Novokuznetsk	300,000
Do.		Sayanogorskiy AZ (United Company RUSAL)	Sayanogorsk	550,000
Do.		Uralskiy AZ (United Company RUSAL)	Kamensk-Uralskiy	150,000
Do.		Volgogradskiy AZ (United Company RUSAL)	Volgogradskaya Oblast'	175,000
Do.		Volkhovskiy AZ (United Company RUSAL)	Volkhov, east of St. Petersburg	20,000
Amber		Kaliningrad Amber enterprise (Kaliningrad regional authorities and Alrosa Co. Ltd.)	Kaliningrad Oblast'	250
Antimony:				
Sb content of concentrate		GeoProMining, Ltd. (GPM)	Sarylakh deposit, Ust'-Nera region, Sakha Republic (Yakutiya)	8,000[2]
Do.		do.	Sentachan deposit, Northeastern Sakha Republic (Yakutiya)	NA
Do.		Zabaykal'skiy GOK (ZabGOK) (OOO NefteChimMash)	Zabaykal'skiy Kray	360,000
Compounds and metals		Ryazsvetmet plant	Ryazanskaya Oblast'	NA
Apatite, concentrate		Khibiny apatite association (OAO Apatit)	Kola Peninsula	15,000,000
Do.		Kovdor iron ore mining association	do.	700,000
Asbestos		Bazenovskoye chrysotile deposit	Sverdlovskaya Oblast'	NA
Do.		Molodeznoye deposit	Zabaykal'skiy Kray	NA
Do.		"Orenburg Minerals" Co., Kiembaevskoye chrysotile deposit	Orenburgskaya Oblast'	500,000
Do.		"Tuvaasbest" plant, Ak-Dovurakskoye chrysotile deposit	Tyva Republic	250,000
Do.		"Uralasbest" mining and clarification plant	Central Urals	1,100,000
Barite		Salarinskiy mining and beneficiation complex	Kvartsitovaya Sopka deposit	100,000
Bauxite		OAO Sevuralboksitruda (United Company RUSAL)	Severoural'sk region	NA
Do.		South-Urals mining company (United Company RUSAL)	South Urals	NA
Do.		Severnaya Onega Mine (United Company RUSAL)	Northwest region	800,000
Do.		Komi Aluminum (United Company RUSAL)	Sredne-Timanskiy	3,000,000
Boron, boric acid		Bor Association	Primorskiy Kray	140,000
Do.		Amur River complex	Russian Far East	8,000
Do.		Alga River chemical complex	do.	12,000
Chromite		Saranov complex	Saranovskiy	200,000
Coal	thousand metric tons	Donetskiy (east) basin	Rostovskaya Oblast'	30,000
Do.		Irkutskiy basin	Irkutskaya Oblast'	NA
Do.	thousand metric tons	Kansko-Achinskiy basin	East Siberia	50,000
Do.	do.	Kuznetskiy basin (Kuzbass)	West Siberia	160,000
Do.		Lenskiy basin	Sakha Republic (Yakutiya)	NA
Do.		Minusinskiy field	Khakasiya Republic	NA
Do.	thousand metric tons	Moscovskiy basin	Moscow region	15,000
Do.	do.	Neryungri basin	Sakha Republic (Yakutiya)	15,000
Do.	do.	Pechorskiy basin	Komi Republic	30,000

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Coal—Continued thousand metric tons	South Yakutiya basin	Sakha Republic (Yakutiya)	17,000
Do.	Ulughemskiy basin	Tyva Republic	NA
Do.	Yuzhno-Yakutskiy basin	Sakha Republic (Yakutiya)	NA
Cobalt	OJSC MMC Norilsk Nickel (Nornickel)	Norilsk, Kola Peninsula	4,000
Do.	Rezh and Yuzhuralnikel enterprises	South Urals	2,100
Do.	Ufaleynikel Co.	Chelyabinskaya Oblast', Urals	4,000
Do.	Khovu-Aksynskoe (nickel-cobalt) deposit	Khovu-Aksy, Tyva Republic	NA
Copper:			
Cu in concentrate	OJSC MMC Norilsk Nickel (Nornickel)	Norilsk region, Kola Peninsula	500,000
Do.	ZAO Russkaya Mednaya Kompaniya (RMK)	Urals	70,000
Do.	Metalloinvest Holding	Udokan, Zabaykal'skiy Kray	NA
Do.	OAO Ural'skaya Gorno-Metallurgicheskaya Kompaniya (UGMK)	do.	230,000
Metal, refined	OJSC MMC Norilsk Nickel (Nornickel)	Norilsk region, Kola Peninsula	450,000
Do.	ZAO Russkaya Mednaya Kompaniya (RMK)	Urals	170,000
Do.	OAO Ural'skaya Gorno-Metallurgicheskaya Kompaniya (UGMK)	do.	360,000
Diamond, gem and industrial thousand carats	Almazy Rossii-Sakha Joint Stock Co. (Alrosa Co. Ltd.) enterprises:	Sakha Republic (Yakutiya) mines:	
	Udachnyy mining and beneficiation complex	Zarnitsa and Udachnyy	NA
Do. do.	Mirny mining and beneficiation complex	Mir and International	NA
Do. do.	Aikhal mining and beneficiation complex	Aikhal and Komsomol'skiy	NA
Do. do.	Anabaraskiy mining and beneficiation complex	Alluvial mines	NA
Do. do.	Nyurbinskiy mining and beneficiation complex	Nyurbinskiy and Botuobinskiy	NA
Do. do.	Lomonosov	Arkhangel'skaya Oblast'	NA
Feldspar	Kheto-Lanbino and Lupikko deposits	Kareliya Republic	NA
Ferroalloys	ChEMK Industrial Group enterprises:	Locations:	
Do.	Chelyabinsk electrometallurgical plant	Chelyabinskaya Oblast'	450,000
Do.	Kuznetsk ferroalloys plant	Novokuznetsk	400,000
Do.	Chusovoy iron and steel plant	Permskiy Kray	NA
Do.	Klyuchevsk ferroalloy plant	Dvurechensk	160,000
Do.	Kosaya Gora iron works	Kosaya, Gora	200,000
Do.	Lipetsk iron and steel works	Lipetskaya Oblast'	NA
Do.	Serov ferroalloy plant [a subsidiary of Eurasian Natural Resources PLC (ENRC)]	Sverdlovskaya Oblast'	NA
Ferronickel	Ufaleynikel Co.	Chelyabinskaya Oblast', Urals	5,000
Ferrovanadium	Vanadii-Tulachermet (Evraz Group)	Tula, North Caucasus	NA
Fluorspar	Abagaytuy deposit	Transbaikal	NA
Do.	Usugli Mine	do.	NA
Do.	Kyakhtinsky deposit	do.	NA
Do.	Kalanguy mining complex	Zabaykal'skiy Kray	NA
Do.	Yaroslavsky mining and beneficiation complex	Pogranichnoye and Vosnesenskoye deposits, Primorskiy Kray	NA
Gallium	Achinsk (United Company RUSAL)	Achinsk in Eastern Siberia	15[2]
Do.	OOO Galliy	NA	NA
Do.	Novosibirsk tin complex	Novosibirsk	NA
Do.	Pikalevo (United Company RUSAL)	Pikalevo	NA
Germanium, metal and products	Federal State Unitary Enterprise Germanium	Kranoyarsk	7
Gold kilograms	Mining companies:	Mining regions:	
	ZAO Amur a/s	Khabarovskiy Kray	5,500
Do. do.	OAO Buryatzoloto	Buryatiya Republic	5,000
Do. do.	ZAO Chukotskaya Mining and Geological Co. (Chukotskaya GGK)	Chukotskiy Avtonomnyy Okrug	15,000
Do. do.	OOO Mining and Geological Co. (GRK) Aldanzoloto	Sakha Republic (Yakutiya)	4,000
Do. do.	Highland Gold Mining Ltd. (HGM)	Khabarovskiy and Zabaykal'skiy Kray	NA

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Gold—Continued	kilograms	Mining companies—Continued:	Mining regions—Continued:	
		Kinross Gold Corp.	Chukotskiy Avtonomnyy Okrug	NA
Do.	do.	LT-Resurs, ZAO	Irkutskaya Oblast'	2,700
Do.	do.	OOO Neryungri-Metallik	Sakha Republic (Yakutiya)	1,500
Do.	do.	OOO Nirungan	do.	1,100
Do.	do.	OAO Omchak	Magadanskaya Oblast'	3,000
Do.	do.	OAO Omolonskaya ZRK	do.	5,000
Do.	do.	ZAO Omsukchanskaya GGK	do.	3,000
Do.	do.	Oyna, a/s	Tyva Republic	1,500
Do.	do.	Petropavlovsk plc	Petropavlovsk	23,000
Do.	do.	OAO Pokrovskiy Mine	Amurskaya Oblast'	6,000
Do.	do.	OAO Polimetal	Magadanskaya and Sverdlovskaya Oblast's, Khabarovskiy Kray	7,500
Do.	do.	Polyarnaya, a/s	Chukotskiy Avtonomnyy Okrug	1,000
Do.	do.	OAO Polyus Gold	Krasnoyarskiy Kray	50,000
Do.	do.	OOO Priisk Drazhnyy	do.	1,200
Do.	do.	OAO Priisk Solov'yevskiy	Amurskaya Oblast'	1,500
Do.	do.	OOO Ros-DV	Khabarovskiy Kray	1,100
Do.	do.	OOO Russdragmet	Khabarovskiy Kray, Zabaykal'skiy Kray	6,000
Do.	do.	OAO Seligdar	Sakha Republic (Yakutiya)	3,000
Do.	do.	Severstal Nordgold NV	Russia, Kazakhstan, and West Africa	10,200
Do.	do.	OOO Sovrudnik	Krasnoyarskiy Kray	3,900
Do.	do.	OAO Susumanzoloto	Magadanskaya Oblast'	3,000
Do.	do.	OAO Uralelktomed'	Sverdlovskaya Oblast'	1,400
Do.	do.	Vitim, a/s	Irkutskaya Oblast'	2,900
Do.	do.	Vostok, a/s	Khabarovskiy Kray	1,100
Do.	do.	OOO Vysochayshiy (GV Gold)	Irkutskaya Oblast' and Sakha Republic (Yakutiya)	5,500
Do.	do.	OOO Yuzhuralzoloto	Chelyabinskaya Oblast'	6,500
Do.	do.	Zapadnaya, a/s	Krasnoyarskiy Kray	1,900
Do.	do.	ZAO Zolotaya, ZDK	Khakasiya Republic	1,200
Indium:				
Primary		Chelyabinsk zinc plant	Chelyabinskaya Oblast'	6
Secondary		Elektrozink plant	Vladikavkaz, North Caucasus	6
Iron ore		Kursk Magnetic Anomaly (KMA) region, which contains the following enterprises:	Locations:	50,000,000[2]
		Lebedi and Stoilo	Gubkin	
		Mikhaylovka	Zheleznogorsk	
Do.		Northwest region, which contains the following enterprises:	Locations:	22,000,000[2]
		Kostomuksha	Kostomuksha	
		Kovdor	Kola Peninsula	
		Olenegorsk	Olenegorsk	
Do.		Siberia region, which contains the following enterprises:	Locations:	18,000,000[2]
		East:		
		Korshunovo	Zheleznogorsk	
		Rudnogorsk	Rudnogorsk	
		West:		
		Abakan	Abaza	
		Sheregesh	Sheregesh	
		Tashtagol	Tashtagol	
		Teya	Vershina Tei	

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Iron ore—Continued	Urals region, which contains the following enterprises:	Locations:	22,000,000 [2]
	Akkermanovka	Novotroitsk	
	Bakal	Bakal	
	Goroblagodat	Kushva	
	Kachkanar	Kachkanar	
	Magnitogorsk	Magnitogorsk	
	Peshchanka	Rudnichnyy	
Lead, metal	Dalpolymetal lead smelter	Rudnaya in Primorskiy Kray	20,000
Do.	Elektrozink lead smelter [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucasus	40,000
Lead and zinc, recoverable content of ore:			
Lead, recoverable Pb content of ore	Altay mining-beneficiation complex	Altay Kray, Southern Siberia	2,000
Do.	Dalpolymetal mining-beneficiation complex	Primorskiy Kray	20,000
Do.	Nerchinsk polymetallic complex	Zabaykal'skiy Kray	7,000
Do.	Sadon lead-zinc complex	North Ossetia	5,000
Do.	Salair mining-beneficiation complex	Kemerovskaya Oblast'	2,000
Zinc, recoverable Zn content of ore	Altay mining-beneficiation complex	Altay Kray, Southern Siberia	1,000
Do.	Dalpolymetal mining-beneficiation complex	Primorskiy Kray	25,000
Do.	Nerchinsk polymetallic complex	Zabaykal'skiy Kray	12,500
Do.	Sadon lead-zinc complex	Severnaya Osetiya	14,000
Do.	Salair mining-beneficiation complex	Kemerovskaya Oblast'	10,500
Limestone	Mazulsky Mine (United Company Rusal)	Goryachegorsk massif, Eastern Siberia	NA
Lithium and its compounds	JSC Novosibirsk Chemical Plant (TVEL Corp.)	Novosibirsk	NA
Do.	JSC Chemical-Metallurgical Plant (TVEL Corp.)	Kransnoyarsk	NA
Magnesite	Karagayskiy open pit (Magnezit Group) and Magnezitovaya underground mine (Magnezit Group)	Sakha group of deposits (Chelyabinskaya Oblast')	3,800,000 [2]
Magnesium, metal (for sale)	Avisma plant	Berezniki	35,000
Do.	Solikamsk plant (Uralkali)	Permskiy Kray	30,000
Mica	Emel'dzhak deposit, Aldan Shield	Sakha Republic (Yakutiya)	NA
Do.	Lopatova Guba mica pit, Northern Kareliya	Kareliya Republic	NA
Do.	Kovdor phlogopite mine (Mica Mine; Slyuda Mine; Kovdorslyuda Shaft)	Kola Peninsula, Murmanskaya Oblast'	NA
Do.	Irkutsk complex (JSC "Vostoksluda")	Mam deposit, Irkutskaya Oblast'	NA
Molybdenum	Dzhida tungsten-molybdenum mine	West Transbaikal	NA
Do.	Sorsk molybdenum mining enterprise	Khakasiya Republic	NA
Do.	Tyrnyauz tungsten-molybdenum mine [OAO Kabardino-Balkarskaya Tungsten-Molybdenum Co. (Government of Kabardino-Balkarskaya Republic)]	Republic of Kabardino-Balkariya, North Caucasus	NA
Do.	Shakhtaminskoye molybdenum mining enterprise	Zabaykal'skiy Kray	NA
Natural gas million cubic meters	Komi Republic	Komi Republic	8,000
Do. do.	Norilsk area	Norilsk region and Kola Peninsula	5,500
Do. do.	North Caucasus	North Caucasus	6,000
Do. do.	Sakhalin	Russian Far East	2,000
Do. do.	Tomsk Oblast	Western Siberia	500
Do. do.	Tyumen Oblast, of which:	do.	575,000 [2]
Do. do.	Medvezhye field	do.	(75,000)
Do. do.	Urengoy field	do.	(300,000)
Do. do.	Vyrngapur field	do.	(17,000)
Do. do.	Yamburg field	do.	(170,000)
Do. do.	Bovanenko field	Yamal Peninsula	NA
Do. do.	Pestsovoyy field	Ob-Taz Gulf area	NA
Do. do.	Zapolyarnyy field	do.	NA
Do. do.	Schtokmanov field	Barents Sea	NA

See footnotes at end of table.

TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Natural gas—Continued	million cubic meters	Urals	Ural'skiye Gory	45,000
Do.	do.	Volga	Vologodskaya Oblast'	6,000
Do.	do.	Yakut-Sakha	Sakha Republic (Yakutiya)	1,500
Nepheline syenite		Apatite complex	Kola Peninsula	1,500,000
Do.		Kiya-Shaltyr Mine (United Company RUSAL)	Goryachegorsk massif, Eastern Siberia	NA
Nickel:				
Nickel in ore		OJSC MMC Norilsk Nickel (Nornickel)	Kola Peninsula and Norilsk region	300,000
Do.		OAO Ufaleynikel [Koks Company of Industrial Metallurgical Holding]	Chelyabinskaya Oblast', Urals	17,000
Do.		OAO Yuzhuralnikel [OAO Mechel]	South Urals	3,000
Metal:				
Smelting		OJSC MMC Norilsk Nickel (Nornickel)	Norilsk region, Kola Peninsula	160,000
Do.		do.	Pechenga	50,000
Do.		do.	Monchegorsk	50,000
Refining		do.	do.	140,000
Do.		do.	Norilsk region, Kola Peninsula	100,000
Nickel products and nickel in ferronickel		Enterprises: ZAO Rezhnickel [Ural Mining and Metallurgical Co. (UMMC)] OAO Ufaleynikel [Koks Industrial Metallurgical Holding Co.] Yuzhuralnikel [Mechel OAO]	Location: South Urals do. do.	65,000[2]
Niobium (columbium)		Kamarsurt mining enterprise (AO Sevredmet)	Lovozerskoye deposit, Kola Peninsula	12,000
Oil shale		Leningradslanets Association	Slantsy, Leningradskaya Oblast'	5,000,000
Petroleum		Bashneft'	Bashkortostan Republic	12,000,000
Do.		Gazprom Neft'	Deposits throughout Russia	50,000,000
Do.		OAO Lukoil	West Siberian deposits: Kechimovskoye Nivagalskoye Urals deposits Volga Region Timen Pechora deposit: Yuzhnaya Khylchuya Komi Republic deposits: Kyrtayelskoye Pashshorskoye Perevoznoye	100,000,000[2]
Do.		OAO Novatek	Western Siberia	5,000,000
Do.		OAO NK Rosneft'	Deposits throughout Russia	120,000,000
Do.		Russneft'	Central and Western Siberia, Urals and Volga regions	15,000,000
Do.		Slavneft'	Western Siberia and Krasnoyarskiy Kray	20,000,000
Do.		OAO Surgutneftegas	Khanty-Mansiyskiy Avtonomnyy Okrug (HMAO)	60,000,000
Do.		Tatneft'	Deposits: Romashkinskoye Novo-Elkkhovskoye Bavlinskoye Bondyuzskoye Pervomayskoye Sabandchinskoye	30,000,000[2]

See footnotes at end of table.

TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Petroleum—Continued	OAO TNK–BP Holding	Deposits: Kamennoye Kovyatka Russkoye Suzunskoye Tagulskoye Uvat Verkhnechonsk	80,000,000 [2]
Phosphate rock	Kingisepp complex (OAO Fosforit)	Leningradskaya Oblast'	3,500,000
Do.	Lopatino and Yegorevsk deposits	Moscow Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Urals	NA
Phosphate rock, apatite concentrate	OAO Apatit (Phosagro)	Kola Peninsula	12,000,000
Do.	Kovdor iron mining complex	do.	700,000
Platinum-group metals:			
Ore, platinum-group-metal content	OJSC MMC Norilsk Nickel	Norilsk region, Kola Peninsula	150
Do.	AO Koryakgeoldobycha, Amur Prospectors	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10
Do.	Lopatino and Yegorevsk deposits	Moscow Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Ural'skiye Gory	NA
Do.	OAO AS Amur (Russian Platinum Co.)	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10
Metal	Krasnoyarsk Nonferrous Metals Plant (Krastsvetmet)	Krasnoyarskiy Kray	NA
Do.	Ekaterinburgskiy plant (EZOTsM)	Sverdlovskaya Oblast'	NA
Do.	Priobsk plant (OJSC Gazprom Neft)	Khanty-Mansiyskiy Avtonomnyy Okrug (HMAO)	NA
Potash, K_2O equivalent	OAO Uralkali	Verkhnekamskoye deposit	8,000,000
Do.	OAO Silvinit[3]	Solikamsk-Berezniki regions, Urals	NA
Do.	OAO Akron	Novgorod	NA
Rare earths	OAO Apatit	Lovozerskoye deposit, Kola Peninsula	NA
Salt	AO Bassol'	Lake Baskunchak in Astrakhanskaya Oblast'	2,500,000
Do.	Dus-Dagskoe deposit	Dus-Dag Mountains	25,000
Silver	Dukat Mine	Magadanskaya Oblast'	1,000
Do.	Kinross Gold Corp.	Chukotskiy Avtonomnyy Okrug	NA
Soda ash	Achinsk plant	Eastern Siberia	595
Do.	Berezniki plant	Ural'skiye Gory	1,080
Do.	Pikalevo plant	Leningradskaya Oblast'	200
Do.	Sterlitamak plant	Bashkortostan Republic	2,135
Do.	Volkhov plant	Leningradskaya Oblast'	20
Steel, crude	OAO Amurmetal	Komsomol'sk-na-Amure	1,600,000
Do.	JSC Asha Metallurgical Plant	Chelyabinskaya Oblast'	450,000
Do.	Beloretsk Iron and Steel Works	Bashkirskoye	380,000
Do.	Chusovskoy Iron and Steel Works	Permskiy Kray	570,000
Do.	JSC Electrostal Metallurgical Plant	Moscow	314,000
Do.	Gorkovskoy Metallurgichesky Zavod	Nizhegorodskaya Oblast'	78,000
Do.	Gur'yevsk Steel Works	Kemerovskaya Oblast'	160,000
Do.	Karaganda	Karagandinskaya Oblast'	6,300,000
Do.	Kuznetsk Steel Works	Kemerovskaya Oblast'	4,700,000
Do.	Lys'va Metallurgical Plant	Permskiy Kray	350,000
Do.	OAO Magnitogorsk mining and metallurgical complex (MMK)	Chelyabinskaya Oblast'	16,200,000

See footnotes at end of table.

TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Steel, crude—Continued	OAO Mechel	Chelyabinskaya Oblast'	7,000,000
Do.	Nizhniy Sergi Steel Works	Sverdlovskaya Oblast'	300,000
Do.	Nizhniy Tagil mining and metallurgical complex (NTMK) (Evraz Group)	do.	8,000,000
Do.	Nosta JSC (JSC Orsk-Kahlilovo Iron and Steel Works)	Novotroitsk, Orenburgskaya Oblast'	4,600,000
Do.	Novolipetskiy mining and metallurgical complex (NLMK)	Lipetskaya Oblast'	9,900,000
Do.	Novosibirsk Steel Works (Novosibprokat)	Novosibirskaya Oblast'	1,100,000
Do.	CJSC Omutninsk Metallurgical Plant	Kirovskaya Oblast'	210,000
Do.	Oskol Electric Steel Works (OEMK)	Staryi Oskol	2,500,000
Do.	Petrovsk-Zabaykal'skiy Steel Works	Petrovsk-Zabaykal'skiy	426,000
Do.	Revdinskiy Steel and Wire Production Works	Sverdlovskaya Oblast'	281,000
Do.	Salda Steel Works	do.	1,900
Do.	Serov Steel Works	do.	1,000,000
Do.	Serp i Molot (Moscow Metallurgical Works)	Moskovskaya Oblast'	70,000
Do.	Severskiy Tube Works	Polevskoy, Sverdlovskaya Oblast'	825,000
Do.	OAO Severstal	Vologodskaya Oblast'	14,000,000
Do.	Sibelektrostal Metallurgical Works	Krasnoyarskiy Kray	110,000
Do.	Sulinskiy Steel Works (Staks)	Rostovskaya Oblast'	280,000
Do.	Taganrog Iron and Steel Works (Tagmet)	do.	925,000
Do.	OAO Tulachermet	Tul'skaya Oblast'	18,400
Do.	Viz-Stal (Verkh-Isetsk Steel Works)	Sverdlovskaya Oblast'	132,000
Do.	Volgograd Steel Works (Red October)	Volgogradskaya Oblast'	2,000,000
Do.	Vyksa Steel Works	Nizhegorodskaya Oblast'	540,000
Do.	Zapadno-Sibirskiy mining and metallurgical complex (ZSMK) (Evraz Group)	Kemerovskaya Oblast'	6,900,000
Do.	Zlatoust Iron and Steel Works	Zlatoust, Chelyabinskaya Oblast'	1,200,000
Talc	Onotsk deposit	Irkutskaya Oblast'	NA
Do.	Kirgiteysk deposit	Krasnoyarskiy Kray	NA
Do.	Miass deposit	Chelyabinskaya Oblast'	NA
Do.	Shabrovsk deposit	Sverdlovskaya Oblast'	NA
Tantalum, ore	Facilities:	Deposits:	10[2]
	Zabaykalskiy mining and beneficiation complex	Etykinskoye deposit	
	NA	Lovozerskoye deposit, Kola Peninsula	
Tellurium	OJSC MMC Norilsk Nickel	NA	5
Do.	Ural Mining and Metallurgical Co. (UMMC)	Urals	35
Tin:	Novosibirsk mining and beneficiation complexes:	Locations:	
Ore	Khinganskoye olovo (Jewish Autonomous District)	Khabarovskiy Kray	11[4]
Do.	Tin Ore Co.	Solnechnyi deposit, Khabarovskiy Kray	NA
Do.	Pravourmiyskoye	Khabarovskiy Kray	NA
Do.	Deputatskiy (Sakhaolovo)	Sakha Republic (Yakutiya)	NA[4]
Do.	Vostokolovo	Russian Far East	NA[4]
Do.	Iultin mining and beneficiation complex	Magadanskaya Oblast'	NA[4]
Do.	Khrustalnyy mining and beneficiation complex	Primorskiy Kray	NA[4]
Do.	Pevek mining and beneficiation complex	Magadanskaya Oblast'	NA[4]
Metal	Novosibirsk Processing Plant Ltd.	Novosibirskaya Oblast'	NA[4]
Titanium:			
Ore	OOO Lovozerskiy GOK	Murmanskaya Oblast	NA
Do.	OAO Apatit	Kykisvumchorrskoye and Yuksporskoye deposits	NA
Do.	OAO TGOK Ilmenit	Tyuganskoye deposit	NA
Do.	OOO Olekminskiy Rudnik	Kuranakhskoye deposit	NA

See footnotes at end of table.

TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Titanium—Continued:			
Metal	Moscow plant	Moscow	NA
Do.	Podol'sk plant	Podol'sk	NA
Do.	OAO Corp. VSMPO-Avisma	Bereznikovskiy Complex, Permskiy Kray	NA
Sponge	do.	do.	40,000
Do.	Solikamskiy Magnesium Plant (SMZ)	Solikamsk, Permskiy Kray	NA
Tungsten:			
Concentrate, W content	AS Quartz	Bom-Gorkhom deposit, West Transbaikal, Zabaykal'skiy Kray	NA
Do.	ZAO Novoorlovskiy GOK	Spokoyninskoye deposit, Zabaykal'skiy Kray	NA
Do.	KGUP Primteploenergo	Lermontovskoye deposit, Primorskiy Kray	NA
Do.	OAO Primorsky GOK	Vostok-2 deposit	NA
Do.	ZAO Zakamensk	Ruchey Inkur deposit, Barun-Narynskoye deposit	NA
Do.	Tyrnyauz tungsten-molybdenum mine [OAO Kabardino-Balkarskaya Tungsten-Molybdenum Co. (Government of Kabardino-Balkarskaya Republic)]	Republic of Kabardino-Balkariya, North Caucasus	NA
Metal	Gidrometallurg plant	do.	NA
Uranium, U content	Uranium Holding OAO Atomredmetzoloto (ARMZ): ZAO Dalur mining enterprise OAO Khiagda mining enterprise Priargunsky mining and chemical enterprise	Locations: Kurganskaya Oblast' Buryatiya Republic Krasnokamensk, Zabaykal'skiy Kray	3,500
Vanadium:			
Ore	Kachkanar iron mining complex	Ural'skiye Gory	NA
Metal	Chusovoy and Nizhniy Tagil plants	do.	17,000
Pentoxide	Vanadii-Tulachermet	Tul'skaya Oblast', North Caucasus	NA
Zinc:			
Zn content of copper-zinc ore	Bashkir copper-zinc complex	Sibai, Southern Urals	5,000
Do.	Buribai copper-zinc mining complex	Buribai, Southern Urals	1,500
Do.	Gai copper-zinc mining and beneficiation complex	Gai, Southern Urals	25,000
Do.	Kirovgrad copper enterprise	Kirovgrad, Central Urals	1,200
Do.	Sredneuralsk copper complex	Revda, Central Urals	5,000
Do.	Uchali copper-zinc mining and beneficiation complex	Uchalinskiy Rayon, Southern Urals	90,000
Metal	Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	200,000
Do.	Elektrozink plant [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucasus	90,000
Do.	Uralelektromed plant [Ural Mining and Metallurgical Co. (UMMC)]	Verkhnaya Pyshma	17,000
Zirconium:			
Baddeleyite concentrate	Kovdor iron ore mining and beneficiation complex	Kola Peninsula	3,500
Metal	Chepetsky metallurgical plant (TVEL Corp.)	Glazov, Udmurtiya Republic	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2] Capacity estimates are totals for all enterprises that produce that commodity.

[3] Merged with Uralkali in February 2011.

[4] Not in operation as of 2013.

THE MINERAL INDUSTRY OF SERBIA

By Karine M. Renaud

In 2014, flooding in Serbia caused damage to industrial zones and to power generation and mining facilities. Serbia's most affected area was the coal sector; the largest coal mining basin, Kolubara, which provided coal to the thermal powerplants, was flooded. Within the Kolubara mining basin, the Tamnava West and the Viliki Crljeni open pit mines were flooded, and Fields B and D were partially flooded. Other affected areas were roads and railways, which caused major transportation problems (Environmental Protection Agency, 2014, p. 11–12; Kolubara Newsletter, 2014, p. 2; Milatovic, 2014).

In 2014, Serbia's real gross domestic product (GDP) decreased by 1.8% compared with an increase of 2.5% in 2013. Serbia's industrial production decreased by 6.5% in 2014 compared with an increase of 5.5% in 2013 owing to a decrease in the production of electricity, manufactured metal products, and manufactured chemicals and chemical products, as well as decreases in coal and metal ore mining. Serbia's mining and quarrying production decreased by 16.6% in 2014 compared with an increase of 5.3% in 2013. Manufacturing output decreased by 1.4% compared with an increase of 4.8% in 2013. In 2014, mining and quarrying employed 21,812 workers, of which 12,469 were employed in the mining of coal and lignite, 734 in the extraction of crude petroleum and natural gas, 4,173 in the mining of metal ores, 3,337 in other mining and quarrying activities, and 1,099 in mining support service activities. Manufacturing employed 279,289 employees in 2014 compared with 287,147 in 2013 (Statistical Office of the Republic of Serbia, 2015a, p. 253; 2015c, 62; 2015d, p. 115).

Government Policies and Programs

The Law on Mining and Geological Research was adopted in 2011 by the Government but was under review in 2014 owing to perceived deficiencies. The law stipulates the establishment of the Geological Institute of Serbia and formulates a mineral resource management strategy. Under the law, entities performing mining activities in Serbia are required to pay fees for the use of mineral deposits and geothermal resources, including 7% of revenue from hydrocarbons in a liquid and gas state (crude oil and gas) and other natural gases, 5% of revenue from the smelting of all metallic raw materials, 5% of revenue from nonmetallic raw materials, 3% of revenue from all types of coal and oil shale, and 2% of revenue from geothermal energy (Ministry of Mines and Energy, 2014, p. 77).

In 2014, Serbia adopted the Strategy on Sustainable Use of Natural Resources, which follows European Union standards. The objectives of this strategy are to promote the effective and sustainable use of natural resources; reductions in pollution and negative effects on the environment while using natural resources; planning, organization, management, and protection of space and mineral resources in Serbia; increased investment in mining; and development and strengthening of the institutional framework. The Mineral Resource Management Strategy by 2030 for the Republic of Serbia was created at the University of Belgrade (Mining and Geology Department) and by mining and geology field experts. The goal of the strategy is to determine new modern legislation (with a new mining law and related bylaws) to develop mining in Serbia. The Mineral Resource Management Strategy by 2030 was expected to be adopted by 2015 (Serbia Energy, 2014a, b).

Production

In 2014, production of gold and pig iron increased by 51% each; platinum, by 50%; crude steel, by 47%; semimanufactures, by 38%; kaolin and refinery products, by 37% each; silver, by 28%; copper metal (smelter), by 24%; sand and gravel, by 22%; and selenium, by 10%. Production of copper (refined, secondary) decreased by 51%; coal (lignite), by 27% owing to flooding and closure of the Kolubara mining basin; sand (common), by 27%; coal (bituminous) by 21%; lime, by 23%; nitrogen (N content of ammonia), by 16%; and lead ore (Pb content), by 13%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Rudarsko Topionicki Bazen Bor (RTB Bor) was the only producer of copper, gold, and silver in the country. At least six companies were engaged in copper and gold exploration in Serbia, including the Canadian companies Avala Resources Ltd., Dunav Resources Ltd., Euromax Resources Ltd., Mundoro Capital Inc., and Reservoir Minerals Inc., and the British company Orogen Gold plc. Naftna Industrija Srbije a.d. (NIS), which was a joint venture between JSC Gazprom Neft of Russia (56.15%) and the Government of Serbia (29.87%), was the sole producer of natural gas, petroleum, and refined petroleum products in Serbia. Table 2 is a list of major mineral industry facilities.

Mineral Trade

In 2014, the total value of exports was about $14.8 billion compared with about $14.6 billion (revised) in 2013. The export of manufacturing products accounted for 76% of total exports, by value; within manufacturing, base metals accounted for 7.9% of total manufactured exports and 6% of total exports; coke and refined petroleum, 4.2% of total manufactured exports and 3.2% of total exports; and industrial minerals, 1.3% of total manufactured exports and 1% of total exports. Refined copper accounted for 0.8% of total exports, and 62% of total refined copper exports was exported to the Czech Republic; 27%, to Turkey; 6%, to France; 3%, to Belgium; 2%, to Bulgaria; and 1%, to other countries. Aluminum accounted for 1.6% of total exports, and 27% of total aluminum exports was exported to Germany; 13%, to Slovenia; 11%, to Italy; 8%, to Russia; 5%, to Hungary; 4%, to Poland; and 30%, to other countries. Iron and steel products accounted for 0.9% of total exports, and 30%

of total iron and steel exports was exported to Italy; 25%, to Poland; 8%, to Romania; 6% each, to Germany and Slovakia; and 26%, to other countries (Statistical Office of the Republic of Serbia, 2015b, p. 312, 316, 319, 321–323).

The total value of imports in 2014 was about $20.61 billion compared with $20.55 billion (revised) in 2013. Imports of manufacturing products accounted for 48% of total imports. Within the manufacturing sector, base metals accounted for 6.2% of total manufactured imports and 3.0% of total imports, coke and refined petroleum products accounted for 16% of total manufactured imports and 7.7% of total imports, and industrial minerals accounted for 1.8% of total manufactured imports and 0.9% of total imports. Imports of crude petroleum oils and oils obtained from bituminous minerals accounted for 5% of total imports, and 84% of the imports of crude petroleum oils and oils obtained from bituminous minerals was from Russia and 16% was from Kazakhstan. Gas oils accounted for 2% of total imports, and 48% of the gas oil imports was from Hungary; 26%, from Russia; 15%, from Bulgaria; and 8%, from Romania. Natural gas (in a gaseous state) accounted for 3% of total imports, and 98% of the natural gas imports was from Russia and 2% was from Kazakhstan. Coke and semicoke coal accounted for 0.3% of total imports, and 74% of coke and semicoke coal imports was from Bosnia and Herzegovina; 12%, from Hungary; 9%, from Ukraine; and 3% each, from Russia and other countries (Statistical Office of the Republic of Serbia, 2015b, p. 311, 315, 320, 324–326).

In 2014, Serbia's exports to the United States were valued at about $279 million compared with about $524 million in 2013; these included about $2.1 million in petroleum products, $932,000 in gemstones, $748,000 in iron and steel, $414,000 in iron and steel products, $246,000 in nickel, $127,000 in nonferrous metals, and $11,000 in gem diamond. Imports from the United States were valued at about $135 million in 2014 compared with $142 million in 2013; these included about $8 million in nonmetallic minerals, $271,000 in iron and steel products, $74,000 in coal and fuels, $59,000 in nonferrous metals, $38,000 in petroleum products, and $23,000 in precious metals (U.S. Census Bureau, 2014a, b).

Commodity Review

Metals

Copper and Gold.—In 2014, RTB Bor produced 40,898 metric tons (t) of copper metal, 33,175 t of primary copper, 17,225 kilograms (kg) of selenium, 7,360 kg of silver, 1,310 kg of gold (refined), 23 kg of palladium, and 3 kg of platinum. In 2011, S.N.C. Lavalin of Finland signed a contract with Outotec OYJ to modernize RTB Bor's existing copper smelting complex. The modernized smelter was expected to produce 80,000 metric tons per year (t/yr) of copper anode. In 2014, the opening ceremony for a modernized smelter was held in Bor (SCN-Lavalin Group Inc., 2011; Outotec, 2012, p. 5; Tanjung, 2014; Kolektiv, 2015, p. 6).

In December 2014, RTB Bor experienced a 4-day interruption of copper production and $3 million of damage at the Majdanpek Mine owing to a shortage of coal for electricity related to the floods. In September 2014, the Cerovo open pit mine, which is located 15 kilometers (km) northwest of Bor, had to be closed several times owing to rains, which caused water and mud to flood the lowest level of the mine. In 2014, the company identified two new ore bodies, "T1" and "T2," which are located at Jama and contained estimated reserves of about 700,000 t at an average grade of 1.7% copper. Excavation work was underway at "T1" and "T2" (Rudarsko Topionicki Bazen Bor, 2013a–c; 2014a, b; Serbia Energy, 2013b).

In 2010, Avala Resources Ltd. of Canada (Avala) acquired the Timok gold project from Dundee Precious Minerals Inc. through its subsidiary Avala Resources d.o.o. The project was located in east-central Serbia about 270 km southeast of the capital city of Belgrade and to the west of the Cretaceous Timok Magmatic Complex. The Timok gold project, which had a total area of 570.4 square kilometers (km^2) hosts the Bigar Hill, Korkan, Korkan East, and Kraku Pester deposits and comprised the following seven exploration areas: Bigar Istok, Blizna, Breza Malinik, Goli Vrh, Lenovac, Potoj Čuka Tisnica, and Tilva Toma. As of May 2014, the indicated resources for the Bigar Hill, the Korkan, and the Kraku Pester deposits, which are located within the Potoj Čuka Tisnica exploration area, were estimated to be 67.4 million metric tons (Mt) at an average grade of 1.14 grams per metric ton (g/t) gold and to contain 77,000 kg of gold. Inferred mineral resources were estimated to be 4.3 Mt at an average grade of 1.0 g/t gold and to contain 4,400 kg of gold (Avala Resources Ltd., 2014d–f, p. 1, 16).

In August 2014, as a result of the Avala and Dunav Resources Ltd. merger, Avala acquired the Tulare porphyry copper-gold project, which included the Kiseljak and the Yellow Creek deposits. The Tulare porphyry copper-gold project was located in the southwestern part of the Lece Magmatic Complex in southern Serbia. As of March 2014, the inferred resources were estimated to be 547 Mt grading 0.23% copper (Avala Resources, 2014a–c, p. vii, 15).

Reservoir Minerals Inc. (Reservoir Minerals) had a joint-venture agreement with Freeport McMoRan Exploration Corp. (FMEC) for the Timok project, which was composed of the Bretovac-Metovnica, the Bretovac Zapad, the Jasikovo-Durlan Potok, and the Leskovo exploration licensed areas. Reservoir Minerals held a 45% interest the Timok project and FMEC [through its subsidiary Rakita d.o.o. (Rakita)] held the remaining 55% interest. The Timok project also included the Čoka Kupijatra, Kraljevica, and Tilva Njagra Nikolicevo exploration areas, which were held solely by Reservoir Minerals. In 2014, Reservoir Minerals released an NI–43–101-compliant estimate for inferred resources at the newly discovered Cukari Peki copper-gold deposit (which is located in the Bretovac-Metovnica exploration licensed area) of 65.3 Mt grading 2.6% copper and 1.5 g/t gold. Reservoir Minerals (25%) signed an agreement with Orogen Gold plc (75%) of the United Kingdom to reopen the Ginduša and the Rusman Mines and to conduct exploration. In 2014, Orogen Gold and Reservoir Minerals decided to look for a new partner to continue exploration at the Deli Jovan license area. In 2014, Reservoir Minerals held 100% of the exploration license for the Bobija, the Donja Trešnjica, and the Parlozi sediment-hosted copper-silver projects in central Serbia (Orogen Gold plc, 2014, p. 2; Reservoir Minerals, 2014a–g).

Iron and Steel.—In 2014, Zelezara Smederevo d.o.o. (Zelezara) was the only producer of crude steel and pig iron in Serbia. It produced 552,443 t of pig iron and 583,000 t of crude steel. In 2012, the Government purchased the Zelezara steel plant from U.S. Steel Corp. of the United States for $1.00 to prevent its closure and unsuccessfully attempted to prevent any job losses and to find a new strategic partner for Zelezara. In October 2012, the Government (through Serbia's Ministry of Finance and Economy) opened a second public invitation for a new strategic partner and for further development of the Zelezara plant. In March 2013, the Government announced that it would restart operations at Zelezara after the second public invitation expired without bids, and the employees agreed to a 20% wage cut. In April 2014, the 2.2-Mt/yr-capacity steel plant resumed production at one of its two blast furnaces. The company expected to produce about 70,000 metric tons per month of steel at the plant, which was located in Smederevo and had about 5,000 employees. In May 2014, Zelezara halted the operation of the only working furnace for 2 months owing to a lack of supply of raw materials from Ukraine. In July 2014, after 2 months of production being halted, Zelezara started operation of blast furnace No. 2 (Savic, 2013a, b; Scekic, 2013; Veljovic, 2013; Thomson Reuters, 2014; Zelezara Smederevo d.o.o., 2014).

Industrial Minerals

Cement.—The cement industry in Serbia consisted of three cement plants—Beocinska Fabrika Cementa, which was wholly owned by Lafarge S.A of France; Cementara Kosjeric, which was owned by the Titan Group of Greece; and Holcim (Srbija) a.d., which was owned by Holcim Ltd. of Switzerland. Their total annual production capacity was 3.9 million metric tons (Mt) of cement. In 2014, Holcim and Lafarge announced their intention to merge. In order for the merger to be approved, the companies had to sell assets worth $6.4 billion (EUR5.0 billion[1]). CRH plc of Ireland purchased Holcim (Srbja) a.d. from Holcim Ltd. for $7.37 billion (EUR6.5 billion) (Swiss-Serbian Chamber of Commerce, 2014; Byalkova, 2015; International Cement Review, 2015).

Clay and Shale.—In 2014, the production of kaolin increased by 37% to 214,000 t from 156,000 t in 2013. In 2013, the Quarzwerke Gmbh. of Germany took over 87% of Kaolin AD and became and owner of Kaolin AD's subsidiary, Jugo-Kaolin d. o. o., which produced quartz sand. Jugo-Kaolin operated five mines at Kopovi JSCo. Ub (four quartz sand mines and one ceramic clay mine), and silica sand mines at Belorečki near Bor and at Srbokvarc near Zajecar (eKapija, 2013; Serbia Energy, 2013a).

Lithium and Boron.—Rio Tinto plc of the United Kingdom held 100% interest in the Jadar lithium-borate project, which is located about 100 km from the capital city of Belgrade in western Serbia. As of yearend 2013, inferred resources of borates were estimated to be 18 Mt. In 2014, a prefeasibility study was underway. Rio Tinto conducted a two-dimensional seismic survey, and the company also conducted hydrogeologic drilling. Rio Tinto was expected to conduct a three-dimensional seismic survey to obtain a detailed image of the underground rock layers in 2015 (Rio Tinto Minerals plc, 2011; 2014a, p. 219, 221; 2014b, p. 1–5).

Erin Ventures Inc. of Canada held 100% interest in the Piskanja lacustrine-type boron deposit through its subsidiary Balkan Gold d.o.o., which is located within the Jarandol basin in southern Serbia, 160 km south of Belgrade. The Jarandol basin forms the eastern part of the Gradac-Baljevac graben, which is located in the Varder Zone. In September 2014, a preliminary economic assessment was completed by SRK Exploration Services Ltd. of South Africa, and in November, a technical report and mineral resource estimates were completed. Indicated mineral resources were estimated to be 5.6 Mt at an average grade of 30.8% boron trioxide (B_2O_3) with a cutoff grade of 12% B_2O_3, and inferred mineral resources were estimated to be 6.2 Mt at an average grade of 28.8% B_2O_3 with a cutoff grade of 12% B_2O_3 (Tsypukov and Campodonic, 2013, p. 3–4; Erin Ventures Inc., 2014a; Tsypukov and Armitage, 2014, p. 2–3, 8–9).

In January 2013, Erin Ventures received an exploration license for an additional territory within the Jarandol basin, which is adjacent to the Piskanja deposit and the Pobredje boron mine (operated by Government-owned Ibar Mines). The license covered an area of about 35 km^2 and was valid until yearend 2015. In December, the company announced the completion of its phase 1 exploration program, which included mineralogy-petrology studies, photogeology and remote-sensing studies, and the reinterpretation of the geologic maps. The phase 2 program was expected to begin by early 2014; however, Erin Ventures announced that it would temporarily delay the resource certification process for the Piskanja property until the new mining laws in Serbia were ratified (Erin Ventures Inc., 2013, 2014b).

Mineral Fuels

Natural Gas and Petroleum.—In 2014, flooding affected NIS's operations—two warehouses were closed and several gas stations were flooded. NIS operated the Novi Sad and the Pancevo refineries, which had a combined production capacity of 7.3 Mt/yr. In 2012, NIS completed the first stage of its modernization project at its Pancevo refinery, and modernization continued in 2014. The refinery produced only EURO-5 standard gasoline and diesel with a sulfur content of less than 10 parts per million (in accordance with the European Union environmental requirements). In 2012, NIS reported that it had received approval for the construction of a new base oil plant at Novi Sad, which was part of the second stage of the company's modernization project. The project included a $100 million investment in equipment and technology. The new base oil plant was expected to have a production capacity of about 180 t/yr. After the modernization, the production process at Novi Sad was expected to be fully compliant with the European Union environmental requirements; the plant would produce medium distillates for use at the Pancevo refinery. In 2014, NIS completed its exploration for oil and natural gas in

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[1] Where necessary, values have been converted from Euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.784=US$1.00 for 2014 and EUR0.783=US$1.00 for 2013.

Vojvodina, which is located in northern Serbia (table 2; Naftna Industrija Srbije a.d., 2012; 2014a, p. 21, 25, 53; 2014b, p. 7, 24, 37; 2014c).

Outlook

In 2014, devastating floods weakened Serbia's economy, and the GDP was forecasted to grow by only 0.5% in 2015 (International Monetary Fund, 2015). In 2014, development projects in the nonfuel mineral sector continued, including at boron, copper, gold, and lithium deposits; once completed, these projects are likely to provide a significant source of revenue to the Government. Plans to rehabilitate the country's infrastructure, including roads, railways, wastewater treatment plants, and water supply projects, are likely to attract foreign direct investment in the mineral sector and in mineral exploration.

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TABLE 1
SERBIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum ingot, including alloys, secondary		1,739	--	--	--	--
Copper:						
Mine and concentrator output:						
Ore:						
Gross weight	thousand metric tons	10,665	12,216	14,346	16,673	16,714
Cu content of ore		28,400	33,400	41,460 [r]	44,453	45,296
Concentrate, Cu content		24,600	28,100 [r]	34,420 [r]	36,500	35,843
Metal:						
Smelter		21,500	25,500	32,500	33,000	40,898
Refined:						
Primary		21,240	25,251	32,229	32,606	31,584
Secondary		963	3,198	2,473	3,234	1,591
Total		22,203	28,449	34,702	35,840	33,175
Gold, refined	kilograms	356	1,032	900	866	1,310
Iron and steel, metal:						
Pig iron		1,158,839	1,197,693	318,651	366,277 [r]	552,443
Crude steel		1,254,000	1,324,000	346,000 [r]	396,000	583,000
Semimanufactures		2,127,960	1,885,019	480,000 [e]	556,242	766,936
Lead and zinc:						
Ore:						
Gross weight (Pb-Zn ore)		219,000	412,000	500,000	482,516	512,000
Pb content		6,000	8,000	9,000	8,000	7,000
Zn content		2,000	12,000	8,000	12,000	12,000
Pb, refined		1,000	22,000	13,000	15,000	15,000
Platinum-group metals:						
Palladium	kilograms	22	4	22	25	23
Platinum	do.	--	6	3	2	3
Selenium	do.	10,592	12,947	13,200	15,727	17,225
Silver, mine output, Ag content	do.	4,820	4,750	5,224	5,764	7,360
INDUSTRIAL MINERALS						
Cement	thousand metric tons	2,130	2,095	1,831	1,592	1,605
Clays, kaolin		152,000	379,000	155,000	156,000	214,000
Lime	do.	239	274	239	279	215
Limestone, gypsum, and chalk	do.	2,841	2,732	2,976	2,459	2,623
Marble and granite blocks		514	637	182	241	226
Nitrogen, N content of ammonia[e]		84,000	132,000	130,000	130,000	109,000
Salt, all sources		30,816	23,144	16,506	13,704	12,994
Sand, common	thousand cubic meters	1,023	757	1,213	633	462
Sand and gravel, excluding glass sand	do.	5,928	5,776	4,953	3,957	4,845
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	108	142	148 [r]	160 [r]	126
Brown coal	do.	193	350	317	341	354
Lignite	do.	38	40	37	40	29
Total	do.	339	532	502	541	509
Natural gas, gross production	million cubic meters	424 [r]	617 [r]	672	661 [r]	630
Petroleum:						
Crude	thousand 42-gallon barrels	6,420	7,570	8,340	8,630	8,153
Refinery products:						
Gasoline	do.	4,274 [r]	4,401 [r]	3,446 [r]	4,419 [r]	4,615
Kerosene	do.	526 [r]	611 [r]	564 [r]	564 [r]	843
Distillate fuel oil	do.	6,289	4,715 [r]	4,774 [r]	8,131 [r]	8,422
Residual fuel oil	do.	4,123	2,383 [r]	2,637 [r]	2,611 [r]	2,444
Lubricants	do.	111,531	75,117 [r]	59,304 [r]	74,683 [r]	107,254
Total	do.	126,741 [r]	87,226 [r]	70,726 [r]	90,408 [r]	123,578

See footnotes at end of table.

TABLE 1—Continued
SERBIA: PRODUCTION OF MINERAL COMMODITIES[1]

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[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through November 18, 2015.

[2] In addition to the commodities listed, secondary magnesium metal and other mineral commodities may have been produced, but available information was inadequate to make reliable estimates of output.

Source: Republic of Serbia Statistical Office, RTB Bor, World Statistical Association

TABLE 2
SERBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity holders	Location of main facilities	Annual capacity
Aluminum, smelter, secondary	Nissal A.D.	Nis	2
Do.	Impol Seval A.D.	Sevojno	45
Do.	Industricum d.o.o.	Sremska Mitrovica	75
Do.	Seval	Tresnjica	26
Cement	Beocinska Fabrika Cementa (Lafarge S.A., 100%)	Plant at Beocin	2,000
Do.	Holcim (Srbija) a.d. (CHR Group, 100%)	Plant at Novi Popovac	1,400
Do.	Cementara Kosjeric a.d. (Titan Group, 100%)	Plant at Kosjeric	500
Clay, kaolin	Jugo-Kaolin d. o. o. (Quarzwerke Gmbh., 87%)	Slatina Mine	NA
Coal:			
Bituminous	JP PEU Resavica	Ibarski Rudnici Mines near Baljevac and Vrska Cuka Mines	70 [e]
Brown	do.	Underground mines near Resavica, Bogdinac, Bogovina, Krepoljin, and Stavalj	400 [e]
Lignite	MB Kolubara Ltd. (Electric Power Industry of Serbia)	Opencast mines: Field B, Field D, Veliki Crljeni, and Tamnava West near Vreoci	31,000
Do.	TPPs-OCMs Kostolac Ltd. (Electric Power Industry of Serbia)	Opencast mine at Drmno near Kostolac	8,500
Do.	JP PEU Resavica	Underground mine at Lubnica	60 [e]
Copper:			
Mine production, Cu content of concentrate	Rudarsko Topionicki Bazen Bor (RTB Bor) (Government owned)	Cerovo Mine at Bor	36
Do.	do.	Jama Mine and mill at Bor	8
Do.	do.	Mine and mill at Majdanpek	30
Do.	do.	Mine and mill at Veliki Krivelj	20
Metal	do.	Smelter at Bor	80
Do.	do.	Electrolytic refinery at Bor	170
Gold	Rudarsko Topionicki Bazen Bor (RTB Bor) (Government owned)	Cerovo Mine at Bor	NA
Iron and steel:			
Pig iron	Zelezara Smederevo d.o.o.	Two blast furnaces at Smederevo	550
Steel, crude	do.	Plant at Smederevo	2,200
Lead, metal, secondary	Farmakom M.B.	Smelter at Zajaca	NA
Lead-zinc ore	Contango d.o.o.	Mine and mill at Rudnik	250 [e]
Do.	NA	Grot Mine near Vranje	300 [e]
Do.	Farmakom M.B.	Mines at Rajiceva Gora, Ravnaja, and Veliki Cip	350 [e]
Do.	Mineco Group	Mine at Veliki Majdan, near Ljubovija	60 [e]
Lime	Jelen Do a.d. (Nexe Grupa)	Plant in Jelen Dol, west of Cacak	90
Do.	Zelezara Smederevo d.o.o.	Plant at Kucevo	NA
Do.	Ravnaja AD	Plant at Mali Zvornik	NA
Magnesite, concentrate	Magnohrom d.o.o.	Mines near Kraljevo	NA
Magnesium:			
Mine (byproduct of dolomite mining)	MG Serbien d.o.o.	Bela Stena, near Baljevac	NA
Metal:			
Primary	do.	do.	8,500
Secondary	do.	do.	12,000

See footnotes at end of table

TABLE 2—Continued
SERBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity holders	Location of main facilities	Annual capacity
Natural gas	million cubic meters	Naftna Industrija Srbije a.d. (NIS) (JSC Gazprom Neft, 56.15%, and Government, 29.87%)	Throughout northern Serbia	600 [e]
Petroleum:				
Crude	thousand 42-gallon barrels per day	do.	Mainly in northeastern Serbia	24 [e]
Refined		do.	Refinery at Pancevo	4,800
Do.		do.	Refinery at Novi Sad	2,500
Platinum-group metals		Rudarsko Topionicki Bazen Bor (RTB Bor) (Government owned)	Cerovo Mine at Bor	NA
Sand, common		Jugo-Kaolin d. o. o. (Quarzwerke Gmbh., 87%)	Čučuge, Avala, Slatina, Dokmir	NA
Silver		Rudarsko Topionicki Bazen Bor (RTB Bor) (Government owned)	Cerovo Mine at Bor	NA
Zinc, metal		Hemijska Industrija Zorka	Electrolytic plant at Sabac	30

[e] Estimated. Do., do. Ditto. NA Not available

THE MINERAL INDUSTRY OF SLOVAKIA

By Lin Shi

In 2014, Slovakia's gross domestic product (GDP) was about $100 billion. The real GDP rate of growth was 2.5% compared with 1.4% in 2013. Slovakia was the world's fifth-ranked producer of magnesite in 2014 (Statistical Office of the Slovak Republic, 2015; World Bank, The, 2015; Bray, 2016).

Minerals in the National Economy

Slovakia's mining and quarrying sector was not a significant contributor to the country's economy. In 2014, the country's mining industry had modest mineral production. The metals produced included aluminum, copper, pig iron, and steel; industrial mineral products included cement and magnesite; and energy and mineral fuel products included coke and refined petroleum products (tables 1, 2; Statistical Office of the Slovak Republic, 2015, p. 435).

Government Policies and Programs

In June 2014, Slovakia's Parliament approved an amendment to the Geological Act to tighten regulation of the country's uranium mining. In November, the Government approved a long-term energy plan based on greater use of domestic nuclear power to reduce the use of coal for generating electricity. The Ministry of the Economy is responsible for mineral resource development and the issuance of mining permits (World Information Service on Energy, 2015; World Nuclear Association, 2015).

Production

In 2014, Slovakia's ferrosilicon production increased by 20% to 44,030 metric tons (t) from 36,763 t in 2013, ferrosilicomanganese production increased by 11% to 29,643 t from 26,794 t in 2013, and gold production increased by 9% to 582 kilograms (kg) from 533 kg in 2013. Silver production decreased by 14% to 437 kg from 508 kg in 2013 (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mining and mineral facilities.

Mineral Trade

In 2014, Slovakia's total exports were valued at about $76 billion. The country's exported mineral commodities included aluminum, iron and steel and mineral oils and fuels. Slovakia's major export destinations were Germany, which received about 23% of Slovakia's total exports, by value; the Czech Republic, about 14%; Poland, about 9%; Hungary and Austria, about 7% each; and the United Kingdom and France, about 5% each. Slovakia's total imports were valued at about $72 billion in 2014. The imported mineral commodities included copper and mineral oils and fuels. The country's major import partners were Germany, which provided about 19% of Slovakia's total imports, by value; the Czech Republic, about 17%; Austria, about 9%; Russia, about 8%; and Hungary and Poland, about 6% each. Slovakia exported about $2,100 million worth of goods to the United States, of which aluminum was valued at about $320,000 and refined iron and steel products were valued at about $42 million. Slovakia imported about $455 million worth of goods from the United States, of which coal was valued at about $55,000; copper, about $17 million; and petroleum products, about $111,000 (U.S. Census Bureau, 2016a, b; U.S. Central Intelligence Agency, 2016).

Commodity Review

Metals

Aluminum.—Slovalco, a.s. was a fully consolidated aluminum smelter in Ziar nad Hronom, and had the capacity to produce approximately 200,000 metric tons per year of aluminum. Slovalco was 55.3% owned by Hydro Aluminum AS (a subsidiary of Norsk Hydro ASA of Norway) and 44.7% owned by ZSNP, a.s. of Slovakia. In 2014, Slovalco produced a total of 185,330 t of finished aluminum products, which included 117,205 t of aluminum ingots and 70,125 t of aluminum alloys. The company sold 185,537 t of finished aluminum products, which included 117,482 t of aluminum ingots and 68,055 t of aluminum alloys. Slovalco's aluminum exports in 2014 accounted for about 73% of the total volume of the company's annual sales. As of December, Slovalco employed 487 people. The company planned to focus on its two major products—aluminum ingots and aluminum alloys, and it expected to produce and sell about 114,000 t of aluminum ingots and about 69,000 t of aluminum alloys in 2015 (Slovalco a.s., 2015, p. 15).

Antimony, Copper, and Silver.—Global Minerals Ltd. of Canada was developing its fully owned Strieborna antimony-copper-silver project in Roznava, Slovakia. In May 2014, the Strieborna project acquired a mine operating permit, which would allow Global Minerals to move quickly to production once feasibility work was completed and it secured the mine construction financing. Global Minerals's 2014 activity included dewatering of the mine followed by shaft and subsurface rehabilitation down to 300 meters; underground exploration to enhance and expand the resource; and metallurgical testing, mine engineering, and economic evaluations in advance of preliminary economic assessments, which are new requirements from the Canadian securities administrators for mining projects. Global Minerals planned to release the results of its feasibility study in 2015. Global Minerals's Strieborna deposit is a high-grade vein-type deposit in eastern Slovakia that occurs within a mineralized structure. The mineralization is characterized by antimony-, copper-, and silver-bearing minerals (mainly tetrahedrite) (Global Minerals Ltd., 2014a, b).

Gold.—In 2014, EMED Mining held discussions with interested parties on the possible sale of its interests or the formation of a joint venture in Slovakia. In September 2014, Slovakia's Parliament banned the use of cyanide in gold processing (the mining permit process had been suspended in December 2013). EMED Mining's fully owned subsidiary Slovenske Kovy s.r.o. held two exploration licenses in Slovakia. In December 2014, EMED Mining and Prospech Ltd. of Australia reached a conditional agreement to conduct exploration under the two licenses. Prospech Ltd. was a private exploration company (EMED Mining Public Ltd., 2015a, b).

In 2014, Ortac Resources Ltd. of the United Kingdom completed its Sturec project test (pilot sampling). The company intended to use cyanide-free processing at the Sturec project, and potentially other projects, based on the test results. The cyanide-free processing would enable the company to significantly reduce the toxic impact on the environment, which was already contaminated by manufactured fertilizers (ADVFN, 2015; Ortac Resources Ltd., 2015b).

Mineral Fuels and Related Materials

Coal, Natural Gas, and Petroleum.—Slovakia produced about 1.9 million metric tons of coal in 2014. The country was a member of the European Association for Coal and Lignite (Euracoal), which was focused on the security of the energy supply, price stability for energy, and protection of the environment. There was an insignificant coal deposit located in eastern Slovakia that was not exploitable; the country's reserves of mineral fuels were limited to lignite and brown coal. Slovakia imported most of its energy supply, which included crude oil, natural gas, and petroleum products, mainly from Russia (European Association for Coal and Lignite, 2015).

Uranium.—There were multiple exploration targets within the Kuriskova license area that had the potential to expand the country's uranium resources. European Uranium Resources, Ltd. (EUU) of Canada owned the Kuriskova deposit (which is located northeast of Kosice), the Novoveska Huta deposit, and several other deposits. In 2014, EUU continued with drill exploration and metallurgy test work at these deposits under separate licenses. The company appeared to be focused on the feasibility studies and environmental impact assessments for these projects, and also on engaging regional and local stakeholders. The company was seeking and evaluating possible mergers and acquisitions that could enable EUU to become Europe's premier uranium production company (European Uranium Resources, Ltd., 2015).

According to the new amendment to the Geological Act, any company interested in uranium mining in Slovakia would have to ask the six affected municipalities to hold a referendum. The uranium mine at Jahodna, near Kosice, was not affected by the new regulation, however, because an exploration permit had been issued in 2005 (World Information Service on Energy, 2015).

Outlook

No major increases in the production of mineral commodities, except for ferrosilicomanganese and ferrosilicon, are expected to take place in Slovakia in 2015. Slovalco plans to increase the company's aluminum ingot and alloy production and exports. Ortac Resources plans to use cyanide-free processing of gold to ensure environmental protection. The country is likely to continue importing some metallic ores and concentrates to meet domestic demand and some mineral fuels for domestic consumption. Coal production is expected to remain at about the current level over the next few years, and EUU plans to seek new opportunities in uranium mining activities (Slovalco a.s., 2015, p. 15; European Association for Coal and Lignite, 2015; Ortac Resources Ltd., 2015a, p. 6; World Information Service on Energy, 2015).

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TABLE 1
SLOVAKIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum ingot, primary		190,029	187,138	180,671	163,000 [r]	168,000
Copper, smelter, secondary		46,531	48,806	41,713	18,500	18,500
Gold, Au content of concentrate	kilograms	534	398	546	533 [r]	582
Iron and steel:						
Pig iron	thousand metric tons	3,649	3,346	3,519	3,617	3,838
Ferroalloys:						
Ferromanganese		35,449	18,180	12,862	12,000 [e]	12,000 [e]
Ferrosilicomanganese		34,960	25,023	50,089	26,794 [r]	29,643
Ferrosilicon		37,034	38,771	36,869	36,763 [r]	44,030
Steel:						
Crude	thousand metric tons	4,580	4,236	4,403	4,511	4,705
Semimanufactures	do.	4,567	4,223	4,391	4,499	4,694
Silver	kilograms	300	330	441	508 [r]	437
INDUSTRIAL MINERALS						
Asbestos		200	--	--	--	--
Barite:[e]						
Mine output		17,000 [3]	18,000	21,000	24,000 [r, 3]	21,000
Concentrate		13,000	14,000	15,000	17,000 [r]	15,000
Cement, hydraulic	thousand metric tons	2,888	3,219	2,915	3,121	3,319
Clays, bentonite		130,521	119,323	129,930	129,877	130,000
Feldspar[e]		10,000	--	--	5,000 [r, 3]	6,000
Gypsum and anhydrite, crude[e]		87,000 [3]	88,000	85,000	60,000 [r, 3]	65,000
Lime, hydrated and quicklime	thousand metric tons	986	971	903	813	800 [e]
Magnesite, concentrate		1,112,000	751,700	618,400	583,800 [r]	557,100
Nitrogen, N content of ammonia	thousand cubic meters	493,018	486,689	485,518	480,329	480,000 [e]
Perlite[e]		23,000	23,000	24,000	16,000 [r, 3]	17,000
Sand and gravel	thousand metric tons	6,932	6,479	4,238	3,954 [r]	3,863
Silica sand (foundry and glass sands)[e]	do.	620	600	600	600	600
Stone:						
Dolomite	do.	895	952	1,049 [r]	922	900 [e]
Limestone and other calcareous stone for cement	do.	4,952	5,630	5,228	5,425	5,000 [e] [e]
Crushed[e]	do.	11,904	9,855	8,065	8,527	10,189
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite and brown	thousand metric tons	2,378	2,376	2,292	2,009 [r]	1,885
Coke, unspecified		1,570	1,500	1,500	1,500	1,500 [e]
Natural gas	million cubic meters	100	106	110 [e]	91 [r]	87
Petroleum:[e]						
Crude	thousand 42-gallon barrels	130	125	105	95 [r, 3]	95
Refinery products:						
Fuel oil, distillate	do.	21,389	21,000	21,000	21,000	21,000
Fuel oil, residual	do.	3,577	3,600	3,600	3,600	3,600
Gasoline, motor	do.	2,811	3,614	3,395 [3]	3,400	3,400
Jet fuel	do.	465	365	365	365	365
Liquid petroleum gas	do.	1,022	1,000	1,000	1,000	1,000
Other products	do.	10,326 [3]	10,000	10,000	10,000	10,000
Total		40,005 [3]	39,590 [3]	39,600 [r]	39,400	39,400

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through December 3, 2014.

[2] In addition to commodities listed, basalt may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

TABLE 2

SLOVAKIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1]	Location of main facilities	Annual capacity
Aluminum	Slovalco, a.s. (Hydro Aluminum AS, 55.3%, and ZSNP, a.s., 44.7%)	Ziar nad Hronom, central Slovakia	200
Cement	Povazska Cementaren, a.s.	Ladce	NA
Do.	Cemmac a.s. (Asamer & Hufnagl Baustoff Holding Wien GmbH, 82.72%)	Horne Srnie	NA
Do.	Vychodoslovenske staebne hmoty a.s.	Turna	1,300
Do.	Holcim (Slovensko), a.s.	Rohoznik	2,200
Coal, lignite and brown	Hornonitranske Bane Prievidza, a.s. (HBP)	Mines at Cigel, Handlova, and Novaky	2,200
Do.	Bana Dolina, a.s.	Mine east of V'lky Krtis, southern Slovakia	150
Do.	Bana Cary, a.s.	Mine at Cary, western Slovakia	500 e
Coke	U.S. Steel Kosice, s.r.o.	Kosice, eastern Slovakia	NA
Copper, smelter, secondary	Kovohuty, a.s. (Umcor Holding GmbH)	Krompachy, central Slovakia	90
Ferroalloys	Oravske Feroziliatinarske Zavody, a.s. (OFZ) (ArcelorMittal S.A.)	Istebne	170
Gold, in concentrate	Slovenska Banska, spol. s.r.o.	Hodrusa-Hamre	NA
Magnesite	SMZ, a.s. Jelsava	Jelsava, eastern Slovakia	370 e
Do.	Slovenske Magnezitove zavody a.s.	Lubenik, central Slovakia	NA
Do.	GE.NE.S., a.s.	Mutnik, near Hnusta in central Slovakia	NA
Natural gas	NAFTA, a.s.	Oilfields and natural gas fields in western and eastern Slovakia	NA
Do.	ENGAS, s.r.o.	Brno	NA
Petroleum:			
Crude	NAFTA, a.s.	Oilfields and natural gas fields in western and eastern Slovakia	NA
Refinery	SLOVNAFT, a.s. (MOL Plc., 98.5%)	Bratislava	6,000
Do.	Petrochema, a.s.	Dubova	150
Pig iron	U.S. Steel Kosice, s.r.o.	Kosice, eastern Slovakia	4,500
Salt	Solivary, a.s. Presov (Garantovana Group)	Presov, eastern Slovakia	NA
Steel, crude	U.S. Steel Kosice, s.r.o.	Kosice, eastern Slovakia	4,900
Do.	Zeleziarne Podbrezova, a.s.	Podbrezova	600 e
Uranium	European Uranium Resources Ltd. (EUU)	Kuriškova, Novoveska Huta, Jahodna, and several deposits near Kosice	NA
Zeolites	Zeocem, a.s.	Quarry near Nizny Hrabovec and processing plant near Bystre	NA
Do.	VSK Pro-Zeo Ltd.	Humenne	NA

[e] Estimated. Do. Ditto. NA Not available.

[1] Abbreviations used for types of companies include the following: a.s., joint stock company; s.r.o., limited company.

THE MINERAL INDUSTRY OF SLOVENIA

By Lin Shi and John R. Matzko

In 2014, Slovenia's output of mineral commodities was not significant on either a world or regional scale. The country's production of metals included aluminum, crude steel, and refined lead; that of industrial minerals included cement, clay, salt, sand and gravel, crushed stone, and dimension stone; and that of mineral fuels included coal, natural gas, and crude petroleum. Slovenia continued to import most mineral commodities to meet its mineral requirements, including mineral fuels, metallic and nonmetallic minerals and ores thereof, and other mining and quarrying products (table 1).

Minerals in the National Economy

Slovenia's 2014 gross domestic product (GDP) was valued at about $50 billion, and the real GDP growth rate was 3% compared with -1.1% in 2013. The country's mining and quarrying output decreased by 4.2% in 2014 compared with that of 2013 (Statistical Office of the Republic of Slovenia, 2015a, b, 2016; World Bank, The, 2015).

Production

In 2014, Slovenia's production of dimension stone increased to 112,671 metric tons (t), or by 60% compared with that of 2013; bentonite, by 39% to 199 t; chert, by 33% to 15,340 t; crude petroleum, by 23% to 2,683 barrels; cement, by 16% to 1,326,000 t; and crushed dolomite and limestone, by 15% to 8,124,000 t. The country's lignite production decreased by 17% to 3,108,000 t compared with that of 2013; crude ceramic clay, by 12% to 162,405 t; natural gas, by 10% to 2.7 million cubic meters; and silica sands, by 8% to 207,381 t (table 1).

Structure of the Mineral Industry

The major mineral industry facilities that were operating in Slovenia in 2014 and their respective locations and capacities are listed in table 2. Ownership of the facilities was a mix of private enterprises and state ownership; there were no significant changes in ownership in 2014 compared with that in 2013 (tables 1 and 2).

Mineral Trade

Slovenia's total exports were valued at about $31 billion in 2014 compared with about $29 billion (revised) in 2013. The country's imports were valued at about $29 billion in 2014 compared with about $28 billion (revised) in 2013. The country both exported and imported coal and coke, lubricants, natural gas, and petroleum and petroleum products. The country's major export destinations were, by value of exports, Germany, which received about 19% of Slovenia's total exports; Italy, about 11%; Austria, about 9%; and Croatia, about 7%. The country's imports were mainly from Germany, which provided about 16% of Slovenia's total imports, by value; Italy, about 14%; Austria, about 10%; and the Republic of Korea, about 5%. In 2014, Slovenia exported goods to the United States valued at about $699 million, of which iron and steel mill products were valued at about $61 million, and aluminum and bauxite were valued at about $15 million. Slovenia imported goods from the United States valued at about $301 million, of which fuel oil and other petroleum products were valued at about $39.6 million, and iron and steel products were valued at about $1.3 million (U.S Census Bureau, 2016a, b; U.S. Central Intelligence Agency, 2016).

Commodity Review

Metals

Aluminum.—Talum Aluminij d.o.o., which was owned by Elektro Slovenija d.o.o. (ELES) (83.44% interest), was Slovenia's major primary aluminum and aluminum products producer. The company had an aluminum smelter in Kidricevo. In 2013 (the latest year for which data were available), Talum's aluminum production reached full capacity and the company produced 84,035 t of aluminum. In 2013, the company manufactured 139,314 t of final aluminum products and sold a total of 138,464 t of aluminum products. The company employed 1,079 people at the end of 2013 (Group Talum, 2014, p. 1–3, 6).

ELES was also the operator of the country's electricity transmission system. In late 2012, the Capital Assets Management Agency of the Republic of Slovenia approved ELES's guarantee to supply electricity to Talum from 2013 to 2015. On September 24, 2014, ELES formally took over the new supervisory control and data acquisition/energy management system (SCADA/EMS) produced by ABB Sweden. This new system enabled ELES to better control both domestic and neighboring power networks that are part of the European Network of Transmission System Operators (ENTSO-E), enabled the inclusion of new data sources, and the use of modern management functions, such as sharing subsidiary services, preparation of various forecasts, and automatic voltage regulation (Elektro Slovenija d.o.o., 2014, p. 14, 15, 29; 2015).

Iron and Steel.—Slovenska Industria Jekla d.d. (SIJ) [Slovenian Steel Group] was the leading steel producer in Slovenia. SIJ consisted of five major components, including a steelworks division composed of Acroni Jesenice d.o.o. and Metal Ravne d.o.o.; a distribution and processing division; a scrap division; a semifinished- and finished-steel manufacturing division; and a management division. SIJ's value-added products included stainless sheet steel and tool sheet steel. In 2014, SIJ's crude steel production decreased by 0.4% to 466,835 t from 468,761 t in 2013. The production of cast steel also decreased by 0.4% to 467,000 t from 469,000 t in 2013; however, flat steel production increased by 0.4% and bar steel production increased by 9.8% in 2014. The changes in the company's steel production were driven by market demands. In 2014, SIJ employed an average of 3,064 people during the year, compared with 3,120 in 2013 (SIJ Group, 2015, p. 19–21, 37–39).

Industrial Minerals

Cement.—Salonit Anhovo d.o.o. was the leading cement producer in Slovenia. The company produced standard cement and specialty cement suitable for use in the oil and gas industry, and it had a production capacity of about 1.5 million metric tons per year (Mt/yr). Lafarge Cement Ltd., which was a subsidiary of the Lafarge Group of France, had a production capacity of 0.6 Mt/yr at its Trbovlje plant. The company had a 38% share of the cement market in Slovenia in 2014. Both Salonit Anhovo and Lafarge Cement had invested in the modernization of their plants to comply with both the European Union's and Slovenia's laws on using the best available manufacturing techniques to improve energy efficiency and environmental standards (Wietersdorfer Gruppe, 2014; Lafarge S.A., 2015, p. 37; Salonit Anhovo d.d., 2016).

Mineral Fuels and Other Sources of Energy

In 2014, Slovenia produced about 3.1 million metric tons (Mt) of lignite. In September, production of electricity at the coal-fired Trbovlje thermoelectric powerplant ceased for economic reasons. In 2014, Slovenia produced 5% more primary energy than in 2013. Energy was supplied by multiple sources in 2014, and included petroleum energy (33%), nuclear energy (24%), renewable energy (19%), coal (15%), and natural gas (9%). The country met 56% of its domestic energy demand with its own energy resources. Hydroelectric generation was at a record high in 2014 and produced 32% more electricity than in 2013. In addition, the nuclear powerplant at Krsko produced 20% more electricity in 2014 than in 2013 (Statistical Office of the Republic of Slovenia, 2014; Energy Agency, 2015, p. 40, 42).

Natural Gas.—In 2014, Slovenia's natural gas consumption and the volume of imported natural gas continued to decrease. About 739 million cubic meters of natural gas was imported in 2014 compared with about 841 million cubic meters (revised) in 2013 and about 870 million cubic meters in 2012. Geoplin remained the leading domestic natural gas supplier with a market share of 65.76%; however, the volume of its imported gas decreased by 20%. In 2014, Austria was the leading supplier of natural gas to Slovenia and provided 61% of the gas purchased by suppliers; about 37% of imported natural gas came from Russia. In 2013, Russia was the leading supplier and Austria was second (Energy Agency, 2015, p. 87, 108–110).

At the end of 2014, Ascent Resources plc of the United Kingdom held a 75% interest in the Petisovci gas project, which is located in northeastern Slovenia, through its subsidiary, Ascent Slovenia Ltd. The company reported an independently verified estimate of gas in place of 13 billion cubic meters. In 2014, Ascent continued to search for partners to help fund development costs of the field. In July, the application for an Integrated Pollution Prevention and Control (IPPC) permit, which is required for a new gas plant, was submitted to the Environmental Agency and was approved in December, subject to public consultation (Ascent Resources plc, 2015).

Outlook

Production of minerals and mineral products in Slovenia will likely continue to be modest, indicating that Slovenia will remain dependent on mineral imports to satisfy its domestic requirements. The production of flat sheet steel and bar steel at SIJ may increase in the short term. Domestic natural gas consumption may continue to decrease in the short term, but domestic production and demand will likely increase in the medium to long term as the Petisovci gas project is brought online. The significant increases in production of electricity from hydroelectric, nuclear, and renewable energy sources seen in 2014 may continue in the near term; these sources are likely to play important roles in meeting the country's energy requirements.

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TABLE 1
SLOVENIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum:						
Primary	thousand metric tons	40 [r]	75 [r]	83	84 [r]	83 [e]
Secondary[e]		16,800	18,900	18,300	18,000	18,000
Iron and steel, metal:						
Crude steel from electric arc furnaces		606,000	648,000	632,000	618,000	615,000
Semimanufactures		656,943	706,133	700,826	677,095	664,200
Lead, refined, secondary		14,000	15,000	12,000 [r]	12,000	12,000 [e]
INDUSTRIAL MINERALS						
Cement	thousand metric tons	799	620	953	1,139	1,326
Clays:						
Bentonite		135	168	98	143	199
Ceramic clay, crude		12,279	10,103	165,041 [r]	184,227 [r]	162,405
Salt, all sources		590	4,291	5,684 [r]	3,360 [r]	--
Sand and gravel, excluding silica sands	thousand metric tons	2,443	1,900	1,707	2,143	2,799
Silica sands (quartz and quartzite)		253,866	230,908	219,481	224,387	207,381
Stone, excluding quartzite, crude:						
Aggregate	thousand metric tons	14,495	11,527	9,265	9,211	9,200 [e]
Chert		16,114	18,907	9,960	11,530	15,340
Crushed, dolomite and limestone	thousand metric tons	12,073	9,627	7,557	7,068	8,124
Dimension		55,000 [e]	55,000 [e]	55,906	70,506	112,671
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Subbituminous	thousand metric tons	419	436	314 [r]	-- [r]	--
Lignite	do.	4,011 [r]	4,066 [r]	3,967 [r]	3,721 [r]	3,108
Total	do.	4,430 [r]	4,502 [r]	4,281 [r]	3,721 [r]	3,108
Natural gas	thousand cubic meters	6,675	2,489	1,593	3,033 [r]	2,736
Petroleum, crude	42-gallon barrels	1,561	1,762	2,045 [r]	2,184 [r]	2,683

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through October 15, 2015.

[2] In addition to the commodities listed, kaolin and lime also were produced, but available information was inadequate to make reliable estimates of output.

TABLE 2
SLOVENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, primary	Talum Aluminij d.o.o. [Elektro Slovenija d.o.o. (ELES), 83.44%]	Smelter at Kidricevo	85 [e]
Cement	Salonit Anhovo d.o.o. (Wietersdorfer Gruppe, 100%)	Plant at Anhovo	1,100 [e]
Do.	Lafarge Cement d.d. (Lafarge S.A., 56%, and European Bank for Reconstruction and Development, 44%)	Plant at Trbovlje	600
Coal:			
Subbituminous	Rudnik-Trbovlje-Hrastnik d.o.o. (RTH) (Government, 100%)	Trbovlje Hrastnik Mine near Trbovlje	500 [e, 1]
Lignite	Premogovnik Velenje, d.d. (Holding Slovenske Elektrarne d.o.o., 77.73%)	Mine at Velenje	4,000
Lead, metal, secondary	MPI-Reciklaza Metalurgija, plastika in inženiring d.o.o.	Refinery at Zerjav	35
Salt	SOLINE Pridelava soli d.o.o. (Mobitel d.d.)	Salt pans at Secovlje and Strunjan	2
Steel, crude	Acroni Jesenice d.o.o. (Dilon, d.o.o., 72%, and Government, 25%)	Plant at Jesenice	800
Do.	Metal Ravne d.o.o. (Dilon, d.o.o., 72%, and Government, 25%)	Plant at Ravne na Koroskem	90
Do.	Štore Steel d.o.o. (Unior d.d., 29.25%)	Plant at Store	185 [e]
Stone, natural (granite and marble)	Mineral Ltd.	Plant at Podpec	NA

[e] Estimated. Do., Ditto. NA Not available.

[1] Production ceased in the first quarter of 2013.

THE MINERAL INDUSTRY OF SPAIN

By Alberto Alexander Perez

The gross domestic product (GDP) of Spain, measured at market prices, was $1.39 trillion[1] in 2014 compared with $1.38 trillion in 2013, for a nominal rate of growth of 1%. The country also reported an unemployment rate of 24.4% and a workforce of 22.95 million, with the majority employed in the services, construction, and industrial sectors. Sixty-eight percent of Spain's GDP was generated by the services sector, whereas the industrial sector generated 15.5%; the construction sector, 5%; the agricultural sector, 2.3%; and various other economic activities in the economy, the remaining 9.2%. The output of the industrial sector recorded a 1.2% increase in 2014 compared with the previous year, whereas that of the construction sector decreased by 2.1%. The country's debt increased by 7% compared with that of 2013, to $1.38 trillion, or the equivalent of about 101% of the GDP. The Government's budget deficit amounted to 4.4% of the GDP and was the fifth largest deficit among the countries of the European Union (EU) (Banco de España, 2016a, b; Instituto Nacional de Estadística, 2016a, p. 239, 242, 317, 318; U.S. Central Intelligence Agency, 2016).

Spain is endowed with metallic mineral resources, such as copper, gold, iron, lead, nickel, silver, tungsten, and zinc, and nonmetallic resources, such as clays, diatomite, feldspar (sixth-ranked world producer), fluorspar (sixth-ranked world producer), gypsum, salt, strontium (second-ranked world producer), and talc. In 2014, Spain was ranked 16th among the world's producers of crude steel, accounting for about 0.8% of world production (table 1; World Steel Association, 2015, p. 9; McRae, 2016; Ober, 2016; Tanner, 2016).

Minerals in the National Economy

In 2014, the output of the extractive industries sector (which includes the mining sector, as defined by the Spanish statistical services) remained at about the same level as in 2013, slowing a decreasing production trend that had seen the output of the sector decrease by 46.7% since 2010. In comparison, Spain's manufacturing sector increased production in 2014 by 2%, reversing an average decrease in sector output of 8.3% since 2010. Spain employed 217,113 people in its extractive industries (including energy, water, and sewage); 278,659 people in metallurgy and the manufacture of metallic products (except machinery); and 85,695 people in the extraction and manufacture of nonmetallic mineral products. In 2014, Spain produced energy from the following sources [in thousand metric tons of oil equivalent (ktoe)]: coal (1,577), crude oil (311), and natural gas (21) as well as nuclear power sources (14,933) and renewable energy sources, including wind, solar, and geothermal sources (7,617), hydroelectric sources (3,361), and biomass, biocarburants, and residuals (5,804) (Instituto Nacional de Estadística, 2016a, p. 405, 411, 423).

Government Policies and Programs

Spain's mineral and energy industries are regulated by the Mining Law of July 21, 1973, and the Hydrocarbon Law of October 7, 1998, respectively. The Ministerio de Industria, Energía y Turismo (MIET) was created by the Royal Decree of February 10, 2012, and is responsible for proposing and implementing Government policies on energy, telecommunications, tourism, and industrial development. The Secretaría de Estado de Energía, which is a subunit of the MIET, is responsible for the development of energy and mining policy. The Instituto Geológico y Minero de España (IGME), which is a subunit of the Ministerio de Economía y Competitividad, is the principal Government mineral-resource agency. IGME was created by the Royal Decree of July 12, 1849. IGME is responsible for the research of mineral raw materials by studying and characterizing rocks and mineral deposits of potential economic interest. IGME also contributes to environmental mine planning, recovery, and remediation. Sociedad Estatal de Participaciones Industriales (SEPI), which is a Government-owned holding company that includes mining, was created by Law 20 of June 5, 2006. In the mineral sector, SEPI owned 100% of Hulleras del Norte, S.A. (HUNOSA), a coal producer; 60% of Enusa Industrias Avanzadas, S.A. (ENUSA), a nuclear energy producer; 20% of Red Eléctrica Corporación, S.A. (RECSA), an electricity producer; and 5% of Enagás, S.A. (ENAGAS), a natural gas producer (Instituto Geológico y Minero de España, 2015).

Production

Mineral production data for 2014 were limited; therefore, the majority of the 2014 mineral commodity production data in table 1 have been estimated. In 2014, primary blister copper production increased by 34% to 285,000 metric tons (t); refined primary copper production, by 28% to 274,000 t; mined lead production, by 17% to 7,000 t; and mined zinc production, by 9% to 38,000 t. Natural gas production decreased by 60%, estimated secondary blister copper production decreased by 27% to 9,000 t, and crude petroleum production decreased by 12% (table 1).

Structure of the Mineral Industry

Spain's mineral industry was composed of domestic private companies and international companies that had direct investments in Spanish companies or had subsidiaries in Spain. Repsol YPF, S.A. was the leading mineral fuels company in Spain. Other significant companies were

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[1] Where necessary, values have been converted from euro area euros (EUR) to U.S. dollars (US$) at an average rate of EUR0.7489=US$1.00 for 2014 and EUR0.73=US$1.00 for 2013.

Alcoa Inespal S.A. (AISA), which was a subsidiary of Alcoa Inc. of the United States (Alcoa) and the only producer of aluminum in the country; Alumina Española S.A. [a joint venture of Alcoa (60%) and Alumina Ltd. of Australia (40%)], which owned and operated the San Ciprian alumina refinery; and Orvana Minerals Corp. (OMC) of Canada, which owned Kinbauri España, S.L.U. (Kinbauri), which, in turn, owned and operated El Valle-Boinás and Carlés (EVBC) underground gold-copper-silver mines in the Rio Narcea gold belt of northern Spain. Table 2 is a list of major mineral industry facilities.

Mineral Trade

The total value of Spain's exports was about $321.2 billion in 2014 compared with $342.7 billion in 2013. The total value of Spain's imports was about $354.6 billion in 2014 compared with $344.4 billion in 2013, and Spain had a net trade deficit of $33.3 billion in 2014. Exports of mineral products amounted to $27 billion in 2014 compared with $24.6 billion in 2013, and imports of mineral products amounted to $78.5 billion in 2014 compared with $80.1 billion in 2013. Exports of metals and metal manufactures amounted to $27.8 billion in 2014 compared with $25.8 billion in the previous year, whereas imports of these products amounted to $22.9 billion in 2014 and $21 billion in 2013. Stone manufactures, cement, and ceramic exports from Spain amounted to $7.2 billion in 2014, whereas in 2013 they totaled slightly more than $7 billion; imports of stone manufactures, cement, and ceramic products amounted to $2.8 billion in 2014 and $2.3 billion in 2013 (Instituto Nacional de Estadística, 2016a, p. 353–354; 2016b).

Spain exported $214 billion worth of goods and services to Europe in 2014, which amounted to 67% of the country's total exports, compared with $201 billion in 2013, which was 66% of its total exports. The country imported $205 billion worth of goods and services from Europe in 2014, which amounted to 58% of Spain's total imports compared with $183.4 billion and 56% of all imports in 2013. Spain's exports to Africa in 2014 amounted to $21.8 billion, which was 7% of its exports, compared with $21.4 billion in 2013, which amounted to slightly more than 7%. Spain's imports from Africa amounted to $37.6 billion in 2014, which was more than 10% of its total imports (Instituto Nacional de Estadística, 2016a, p. 355).

Spain's exports to the American continent (defined as North America and South America by Spain's statistical service), amounted to $35.1 billion in 2014, or 11% of its total exports, compared with $33.4 billion in 2013. Spain's imports from the American continent amounted to $39.9 billion in 2014, or 11% of its total imports, compared with $40 billion in the previous year. Spain exported $37 billion worth of goods and services to Asia in 2014, or 12% of its total exports, compared with $34.2 billion in 2013. The country imported $68.7 billion worth of goods and services, or 19% of its total imports from Asia in 2014, compared with $63 billion in 2013 (Instituto Nacional de Estadística, 2016a, p. 355).

United States exports to Spain were valued at about $10.2 billion in 2014 compared with about $10.2 billion in 2013. Petroleum products, including crude oil and fuel oil, accounted for about $697 million; coal and related fuels, about $213 million; nonferrous metals, about $170 million; natural gas liquids, about $71 million; iron and steel products, about $70 million; drilling and oilfield equipment, about $66 million; nonmetallic minerals, $2 million; nonmonetary gold, about $275,000; and copper, $43,000. Total United States imports from Spain were valued at about $14.5 billion in 2014 compared with $11.7 billion in 2013; these included about $2.4 billion in fuel oil and petroleum products; about $229 million in iron and steel mill products; $97 million in drilling and oilfield equipment; about $83 million in natural gas; about $20 million in other nonferrous metals; about $18.6 million in nonmonetary gold; about $15.4 million in bauxite and aluminum; and about $3 million in copper (U.S. Census Bureau, 2016a, b).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Alcoa Inespal had smelters in Aviles in the Province of Asturias, La Coruña in the Province of Galicia, and San Ciprian in the Province of Lugo. Alcoa had 60% ownership in Alumina Española S.A (with the remainder owned by Alumina Ltd. of Australia), which owned an alumina refinery also at San Ciprian. Alcoa planned to convert the alumina refinery in San Ciprian from fuel oil to natural gas, which, according to the company, would yield a $20 per metric ton in savings by 2016; also, the company reported that three gas supply contracts were signed with Union Fenosa Gas S.A., Endesa S.A., and BP p.l.c., respectively The San Ciprian alumina refinery had a nameplate capacity of 1,500,000 metric tons per year (t/yr) whereas the smelter had a nameplate capacity of 228,000 t/yr. The La Coruña and Aviles smelters had nameplate capacities of 87,000 t/yr and 93,000 t/yr, respectively (Alcoa Inc., 2016, p. 11–12, 24).

Copper.—Cobre Las Cruces S.A. [owned by First Quantum Minerals Ltd. (FQM) of Canada] owned and operated the Las Cruces copper mine and refinery located about 20 kilometers (km) northwest of the city of Seville. In 2014, the company installed three pressure filters to improve copper recovery, and it planned to install new cooling towers by 2016 to extend the life of these pressure filters and to further support their performance by helping to address the overall water balance in the processing plant. Las Cruces processed 1,539,000 t of ore in 2014 with a grade of 5.1% copper. The company reported that it had 90% copper recovery from the ore in 2014 (First Quantum Minerals Ltd., 2016, p. 20).

Tungsten.—Saloro SLU (a subsidiary of Ormonde Mining plc of Ireland) owned the Barruecopardo tungsten project, which was located near Salamanca in the Castilla y Leon region. In November 2014, Saloro reported that it had been granted the mining concession for the tungsten project, which covered an area of about 6 square kilometers (km^2), including the Barruecopardo deposit and any potential strike extension. The concession was granted for 30 years with the potential to be renewed twice for 30 years each. Ormonde completed a feasibility study for the Barruecopardo project, which had the potential to be developed as an open pit mine and to produce about 227,000 t/yr of WO_3 during the first 9 years of operation. Ormonde's environmental impact assessment of the Barruecopardo project was approved by the Salamanca Provincial authorities of the Castilla y Leon region in early 2014. In March, the company signed an offtake agreement with Noble Group of Singapore to sell all the tungsten concentrate production from Barruecopardo to Noble for the first 5 years of operation (Ormonde Mining plc, 2014).

Industrial Minerals

Cement.—At least 10 companies were engaged in the production of cement in the country; these included Grupo Alfonso Gallardo (through its subsidiary A.G. Cementos Balboa S.A.), Votorantim Group of Brazil (through its subsidiary Cementos Cosmos S.A.), Cementos Mexicanos S.A.B. de C.V. of Mexico (CEMEX) (through its subsidiary CEMEX España Operaciones, S.L.U.), CRH plc of Ireland (through its subsidiary Cementos Lemona S.A.), Cementos Molins, S.A. (through its subsidiary Cementos Molins Industrial, S.A.U.), Cementos Portland Valderrivas Group (through its subsidiary Cementos Portland Valderrivas, S.A.), Corporación Masaveu (through its subsidiary Cementos Tudela Veguín, S.A.), Holcim Ltd. of Switzerland [Holcim (España) S.A.], Lafarge Cementos S.A. of France, and Italcementi Group of Italy (Sociedad Financiera, S.A.). These companies had a combined cement production capacity of 35.3 million metric tons per year (table 2).

Potash.—Iberpotash S.A., which was owned by Israel Chemical Ltd. (ICL) of Israel, was the only producer of potassium salts in the country. In 2014, two sites produced potash—the Cabanasses Mine in Suria and the Vilafruns Mine in Balsareny. By 2015, Iberpotash was expected to export about 80% of its production to Asia, Europe, North Africa, and South America. Iberpotash employed about 1,200 workers (Barcelona Centre Logistic, 2015; Iberpotash S.A., 2016).

Strontium.—Spain had two active celestite mines—the Aurora Mine, which is located in the Montevives in the region of Granada, and the Escuzar Mine, which is located about 24 km from the city of Granada and about 7 km from the Aurora Mine. The Aurora Mine was owned by Canteras Industriales S.L.; the company had previously stopped operations at the mine for 3 years but had resumed operations at the site in 2012. The Escuzar Mine was owned by Solvay Minerales S.A. (a subsidiary of the Solvay Group of Belgium).The Escuzar Mine produced celestite at a grade of 54% $SrSO_4$ and 0.5% barium. The final concentrate was 90% $SrSO_4$ and was exported principally to Germany to be processed at the Solvay plant in Bad Honningen.

The reserves of celestite (based only on those of the Escuzar plant, which were the only reserve data available) were about 1 million metric tons (Mt), and resources were 12 Mt. The estimated production of celestite concentrate for 2014 was about 91,000 t (Instituto Geologico y Minero de España, 2015, p. 1–7; Societe Chimique de France, 2015; Solvay Group, 2016).

Mineral Fuels and Related Materials

Crude Oil.—Repsol YPF, S.A. owned the exploitation rights for 23 blocks, 13 of which were in the exploration stage and covered a surface area of 5,113 km^2 and 10 of which were in the development and production stages and covered a surface area of 332 km^2. Repsol produced a total of 1.3 million barrels (Mbbl) of crude oil and 200 million cubic feet of natural gas in Spain, mostly in the areas of Casablanca, Lubina, and Montanazo in the Mediterranean Sea. Repsol reported that the company's proven crude petroleum reserves were 5.7 Mbbl (U.S. Energy Information Administration, 2015; Repsol S.A., 2016, p. 52).

Uranium.—Berkeley Resources Ltd. of Australia, through its wholly owned subsidiary Berkeley España S.A., owned 100% interest in the Salamanca project, which included the Alameda, the Gambuta, and the Retortillo deposits. As of October 2014, total indicated and inferred mineral resources were estimated to be 37.3 Mt at an average grade of 367 parts per million (ppm) U_3O_8 at Retortillo and 462 ppm at Alameda. A prefeasibility study for the Alameda and the Retortillo deposits indicated that the project had the potential to be developed as an open pit mine and to produce an average of about 1,225 t/yr of U_3O_8 during the initial 11 years of mine operation (Berkeley Resources Ltd., 2014, p. 4–8; 2015).

Outlook

Spain's GDP is expected to increase in 2015 and to continue its economic recovery from the recent protracted recession (Banco de España, 2015). Spain's power sector is likely to continue to be dependent on coal, crude oil, and nuclear power in the short term. Owing to the country's strong dependence on imported energy sources, the Government is expected to continue to support investments in renewable energy, such as biofuels, geothermal, solar, and wind. Spain's recently adopted national renewable energy action plan, which is in accordance with the EU renewable energy directive, specifies that renewable energy sources must account for at least 20% of member countries' final energy consumption, including a contribution of 10% to transportation, by 2020. Expansion at several of its mining projects and deposits is likely to attract foreign investment in the mineral sector and especially to increase interest in the nonfuel mineral sector.

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TABLE 1
SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2, 3]		2010	2011	2012	2013	2014[e]
METALS						
Aluminum:[e]						
Alumina		1,500,000	1,500,000	1,500,000	1,400,000	1,400,000
Metal, primary		340,000	365,000	230,000	235,000 [r]	230,000
Copper:						
Mine output, Cu content		50,830	75,057	99,884	107,000 [r]	106,000
Metal:[e]						
Blister:						
Primary		236,000	231,000	270,000	212,000	285,000
Secondary		19,000	21,700	25,000	12,300	9,000
Total		255,000	253,000	295,000	224,000	294,000
Refined:						
Primary		236,000	226,000	251,000	214,000	274,000
Secondary		83,000	86,000	88,000	68,000	73,000
Total		319,000	312,000	339,000	282,000	347,000
Gold, mine output, Au content	kilograms	--	529	1,529	1,870	1,800
Iron and steel, metal:[4]						
Pig iron	thousand metric tons	3,572	3,540	3,081	3,949	3,958 [5]
Crude steel	do.	16,343	15,504	13,639	13,740	14,249 [5]
Ferroalloys, electric furnance:[e]						
Ferrosilicon		76,300	69,700	68,600	80,500	80,000
Silicon metal		31,500	34,800	27,200	24,200	24,000
Lead:						
Mine output, Pb content		379	7,813	3,763	6,000 [e, r]	7,000
Metal, refined, secondary[e]		165,000	177,000	160,000	157,000	166,000
Nickel, Ni content of concentrate		5,402	--	2,397	7,574	7,600
Silver, mine output, Ag content	kilograms	--	1,505	4,363	5,400	5,500
Tungsten, mine output, W content		240	497 [6]	542 [6]	510 [6]	500
Zinc:						
Mine output, Zn content		17,358	33,199	28,634	35,000 [e, r]	38,000
Metal, primary and secondary[e]		515,000	524,000	521,000	521,000	527,000
INDUSTRIAL MINERALS						
Barite, $BaSO_4$ content		2,000	--	--	--	--
Cement, hydraulic	thousand metric tons	26,217	22,178	15,939	13,600 [r]	13,500
Clays:						
Attapulgite		27,841	26,021	23,537	25,439	25,400
Bentonite		157,001	110,731	96,605	112,887	112,900
Common	thousand metric tons	12,185	9,940	8,240	8,200 [e]	8,000
Kaolin, crude and washed		184,000	195,000	247,000	247,000 [e]	247,000
Refractory		117,000	139,000	78,000	78,000 [e]	78,000
Sepiolite		557,862	566,270	622,000	622,000 [e]	622,000
Diatomite and tripoli		64,346	54,000	60,777	53,713	53,700
Feldspar		691,894	662,418	530,238	602,908	603,000
Fluorspar, CaF_2 content:						
Acid-grade		123,562	106,294	98,374	86,115	86,000
Ceramic-grade		1,213	1,599	6,699	5,056	5,000
Metallurgical-grade		2,873	4,275	2,250	4,320	4,000
Total		127,648	112,168	107,323	95,491	95,000
Gypsum and anhydrite, crude	thousand metric tons	6,990	7,825	6,360	7,125	7,000
Magnesite, crude		195,893	239,131	274,551	275,000 [e]	275,000
Mica		4,034	3,609	3,518	3,462	3,400
Peat[7]		64,962	86,571	61,379	91,806	91,000
Potash, K_2O equivalent		514,222	520,555	632,477	711,272	711,000
Pumice		432,364	303,462	194,655	195,000 [e]	195,000

See footnotes at end of table.

TABLE 1—Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2,3]		2010	2011	2012	2013	2014[e]
INDUSTRIAL MINERALS—Continued						
Salt:						
Rock	thousand metric tons	3,116	3,096	2,786	2,902	2,900
Marine and other	do.	1,334	1,407	1,323	1,376	1,400
Sand and gravel, silica sand[8]	do.	5,057	5,073	3,416	3,400	3,400
Sodium compounds, n.e.s.,[9] sulfate, natural:						
Glauberite, Na_2SO_4 content		1,146,000	1,049,000	1,276,130	1,329,514	1,300,000
Thenardite, Na_2SO_4 content		135,000	107,000	175,726	234,353	235,000
Stone:						
Basalt	thousand metric tons	2,352	1,919	1,281	1,118	1,100
Chalk	do.	796	665	645	640	650
Dolomite	do.	13,210	10,942	6,926	6,900	7,000
Granite, ornamental	do.	17,208	14,066	10,032	9,200	9,000
Limestone	do.	160,920	129,610	89,332	89,300	90,000
Marble, ornamental	do.	1,452	2,104	1,754	1,382	1,300
Marl	do.	8,316	5,937	5,581	4,486	4,500
Ophite	do.	3,658	2,398	1,520	1,425	1,400
Phonolite	do.	1,018	612	619	620	600
Porphyry	do.	2,028	2,095	1,468	1,073	1,000
Quartz	do.	1,032	892	1,023	949	900
Quartzite	do.	3,017	3,018	2,082	2,058	2,000
Sandstone	do.	2,485	2,072	1,382	1,385	1,400
Slate	do.	365	416	336	377	400
Strontium:						
Celestite concentrate[r]		83,035	97,102	96,688	90,972	91,000
$SrSO_4$ content		74,732	87,392	87,019	84,950	88,000
Talc and steatite		51,897	12,000	8,857	9,000	9,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Anthracite	thousand metric tons	5,990	4,265	3,910	2,543	2,500
Bituminous	do.	2,444	2,358	2,275	1,827	1,800
Total	do.	8,434	6,623	6,185	4,370	4,300
Gas, natural						
Produced	thousand cubic meters	62,707	53,040	64,751	56,664 [r]	22,656 [5]
Petroleum:						
Crude[10]	thousand 42-gallon barrels	905	744	1,069	2,665 [r]	2,336 [5]
Refinery products:[11]						
Naphtha	do.	14,400	14,100	2,610	2,840	2,800
Gasoline, motor[12]	do.	112,000	111,000	61,600	63,700	64,000
Kerosene	do.	63,400	67,600	66,000	66,700	66,600
Petroleum coke	do.	6,460	8,800	17,000	18,900	19,000
Lubricants	do.	1,910	1,570	1,160	1,340	1,400
Total	do.	198,000	203,000	148,000	154,000	154,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through December 30, 2015.

[2]In addition to the mineral commodities listed, lime, sulfur, and refinery products, such as distillate fuel oil, jet fuel, liquefied petroleum gas, refinery fuel, and residual fuel oil were produced, but information was inadequate to make reliable estimates of output.

[3]Sources: Industria y Minería. Ministerio de Industria, Turismo y Comercio—Secretaría General de Energía. Instituto Geológico y Minero de España.

[4]Source: World Steel Association.

[5]Reported figure.

[6]Source: Almonty Industries Inc.

[7]Peat production was only used for agriculture.

TABLE 1—Continued

SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

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[8] Includes sand obtained as a byproduct of feldspar and kaolin production.

[9] Not elsewhere specified.

[10] Production has been converted to barrels from metric tons by using the U.S. Energy Information Admininstration factor of 7.440 barrels per metric ton (bbl/t) of crude petroleum.

[11] Production has been converted from metric tons to barrels by using the U.S. Energy Information Administration's factor of 5.51 barrels per metric ton (bbl/t) for petroleum coke; 8.53 bbl/t for gasoline; 7.73 bbl/t for kerosene; 7.00 bbl/t for lubricants; and 8.22 bbl/t for naphtha.

[12] Includes other gasolines.

TABLE 1—Continued
SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2, 3]		2010	2011	2012	2013	2014[e]
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Total	do.	198,000	203,000	148,000	154,000	154,000

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TABLE 1—Continued

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[12] Includes other gasolines.

TABLE 2

SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Alumina	Alumina Española, S.A. (Alcoa Inc., 60%, and Alumina Ltd., 40%)	Refinery at San Ciprian, Lugo Province	1,500
Aluminum	Alcoa Inespal S.A. (AISA) (Alcoa Inc., 100%)	Smelter at Aviles, Asturias Province	93
Do.	do.	Smelter at La Coruña, Galicia Province	87
Do.	do.	Smelter at San Ciprian, Lugo Province	228
Cement	A.G. Cementos Balboa S.A. (Grupo Alfonso Gallardo)	Alconera, Badajoz Province	1,600
Do.	Cementos Cosmos S.A. (Votorantim Group)	Pontevedra, Lugo Province	650
Do.	do.	Toral de los Vados, Leon Province	1,600
Do.	Cemex España Operaciones, S.L.U. (Cemex S.A.B. de C.V.)	Alcanar, Tarragona Province	2,185
Do.	do.	Alicante, Levante Province	1,400
Do.	do.	Buñol,Valencia Province	1,361
Do.	do.	Castillejo, Toledo Province	1,730
Do.	do.	Lloseta, Balearic Islands	700
Do.	do.	Morata de Jalon, Zaragoza Province	1,400
Do.	Cementos Lemona S.A. (CRH plc, 98.86%)	Lemona, Vizcaya Province	1,250
Do.	Cementos Molins Industrial, S.A.U. (Cementos Molins, S.A.)	Sant Vicenç dels Horts, Barcelona Province	1,780
Do.	Cementos Portland Valderrivas, S.A.	Alcala de Guidaira, Seville Province	1,450
Do.	do.	Venta de Baños, Palencia Province	815
Do.	do.	Mataporquera, Cantabria	830
Do.	Cementos Tudela Veguín, S.A. (Masaveu Group)	Careño, Oviedo, Asturias Province	2,400
Do.	do.	La Robla, Leon Province	850
Do.	do.	Tudela Veguín, Oviedo Province	200
Do.	Holcim (España), S.A. (Holcim Ltd.)	Carboneras, Almeria Province	1,500
Do.	do.	Gardor, Almeria Province	1,000
Do.	do.	Jerez de la Frontera, Cadiz Province	1,000
Do.	do.	Yeles, Toledo Province	975
Do.	Lafarge Cementos S.A.	Montcada i Reixac, Barcelona Province	900
Do.	do.	Sagunto, Valencia Province	1,700
Do.	do.	Villaluenga de la Sagra, Toledo Province	2,350
Do.	Sociedad Financiera, S.A. (Italcementi Group)	Añorga, Gipuzkoa Province	1,050
Do.	do.	Arrigorriaga, Vizcaya Province	1,125
Do.	do.	Malaga, Malaga Province	1,575
Coal	Alto Bierzo S.A.(Grupo Lamelas Viloria)	Various mines	NA
Do.	Carbonar, S.A.	Mines at Vega de Rengos, Asturias Province	NA
Do.	Carbones Arlanza S.L	Minas at Solita y Bravo	NA
Do.	Carbones del Puerto S.A.	Mines at Esmeralda	NA
Do.	Carbones San Isidro y Maria S.L.	Mines at San Isidro	NA
Do.	Cia General Minera de Teruel S.A.	Mines at Elvira	NA
Do.	Coto Minero Cantabrico S.A.	Mines at Coto, Cantabrico, and Unica	NA
Do.	Empresa Nacional de Electricidad S.A.	As Pontes Mine and Andorra Mine, A Coruña	NA
Do.	Empresa Carbonifera del Sur, Encausar, S.A.	Mine at Puertollano	NA
Do.	Hijos de Baldomero Garcia S.A (Grupo Lamelas Viloria)	Mines at Villablino, Leon Province	NA
Do.	Hulleras del Norte S.A. (HUNOSA)	Various mines and plant	NA
Do.	La Carbonifera del Ebro S.A.	Mines at Sant Jordi	NA
Do.	Minera Catalano Aragonesa S.A.	Mines at Ariño	NA
Do.	Sociedad Anonima Hulleras Vasco-Leonesa S.A.	Santa Lucía Mine, Leon Province	NA
Do.	Union Minera del Norte, S.A.	Various mines	NA
Copper:			
Mine output, Cu content	Cobre Las Cruces, S.A. (First Quantum Minerals Ltd., 100%)	Las Cruces Mine at Seville Province	210
Do.	Kinbauri España, S.L.U. (Orvana Minerals Corp., 100%)	El Valle-Boinás and Carlés Mines (EVBC), Asturias Province	7
Do.	Minas de Aguas Teñidas, S.A.U. (MATSA) (Trafigura Beheer B.V)	Mines and plant at Almonaster la Real, Huelva Province	30
Do.	Rio Narcea Recursos, S.A. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura Region	7

See footnotes at end of table.

TABLE 2—Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity^e
Copper—Continued:				
Metal		Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Smelter at Huelva Province	330
Do.		Cobre Las Cruces, S.A. (First Quantum Minerals Ltd., 100%)	Refinery at Seville Province	70
Do.		Elmet S.L.U. (Metallo Chimique N.V.)	Smelter at Berango, Biscay Province	96
Dunite		Pasek España S.A.	Mines and plant at Landoy, Ortigueira, La Coruña Province	1,000
Fluorspar		Minerales y Productos Derivados S.A. (MINERSA)	Mine and plant at Ribadesella, Asturias Province	140
Do.		Minera Orgiva SL	Mine at Lujar, Granada Province	NA
Gold	kilograms	Kinbauri España, S.L.U. (Orvana Minerals Corp., 100%)	El Valle-Boinás and Carlés Mines (EVBC), Asturias Province	2,000
Lead, mine output, Pb content		Minas de Aguas Teñidas, S.A.U. (MATSA) (Trafigura Mining Group)	Mines and plant at Almonaster la Real, Huelva Province	7
Magnesite		Magnesitas Navarras S.A. (Groupe Roullier, 40% and Grecian Magnesite S.A., 40%)	Mine at Eugui, plant at Zubiri, Navarra Province	170
Do.		Magnesitas de Rubián S.A.	Plant at Monte Castelo	70
Nickel, mine output, Ni content		Río Narcea Recursos. S.A. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura Region	8
Petroleum:				
Crude		Repsol YPF, S.A.	Oilfield at Albatros	NA
Do.		do.	Oilfield at Poseidon Norte and Sur	NA
Do.		do.	Oilfields at Angula, Boqueron, Casablanca, and Rodaballo	NA
Do.	42-gallon barrels per day	Repsol YPF, S.A.,100 %	Oilfield at Lubina	2,500
Do.	do.	Repsol YPF, S.A., 68.67%	Oilfield at Montanazo	2,500
Refined	do.	BP p.l.c., 100%	Castellon Refinery, Iberia	45,000
Do.	do.	Compañía Española de Petróleos S.A [International Petroleum Investment Co., 100%]	Refinery at Gibraltar-San Roque, Cadiz Province	245,000
Do.	do.	do.	Refinery at La Rabida, Huelva Province	194,000
Do.	do.	do.	Refinery at Tenerife, Santa Cruz de Terenife Province	92,000
Do.	do.	Refinería de Petróleos del Norte S.A. [Repsol YPF, S.A., 85.98%]	Refinery at Muskiz, Biscay Province	245,000
Do.	do.	Repsol YPF, S.A.	Refinery at A Coruña Province	120,000
Do.	do.	do.	Refinery at Cartagena, Murcia Province	220,000
Do.	do.	do.	Refinery at Puertollano, Cuidad Real Province	150,000
Do.	do.	do.	Refinery at Tarragona Province	186,000
Potash, ore		Iberpotash S.A. (ICL Chemical Ltd.)	Mine and plant at Suria and Balsareny, Barcelona Province	1,000
Sepiolite		Grupo Tolsa S.A.	Mine and plant at Madrid Province	600
Do.		Minería y Tecnología de Arcillas (Grupo SAMCA)	Mines at Zaragoza Province	120
Silver	kilograms	Kinbauri España, S.L.U. (Orvana Minerals Corp., 100%)	El Valle-Boinás and Carlés Mines (EVBC), Asturias Province	5,500
Sodium sulfate		Grupo Industrial Crimidesa S.L.	Mine and plant at Cerezo de Rio Tiron, Burgos Province	700
Steel		ArcelorMittal Corp.	Plants at Aviles and Gijon, Asturias Province; Sagunto, Valencia Province; Sestao, Biscay Province	8,000
Do.		Compañia Española de Laminacion S.L. (Celsa Group, 100%)	Plant at Barcelona Province	2,500
Do.		Corporación Gerdau Sidenor S.A. (Sidenor) (Gerdau Group, 50%)	Plant at Basaur, Biscay Province	2,500

See footnotes at end of table.

TABLE 2—Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Steel—Continued	Corporación Gerdau Sidenor S.A. (Sidenor) (Gerdau Group, 50%)	Plant at Reinosa, Cantabria Province	NA
Do.	do.	Plant at Azkoitia, Gipuzkoa Province	NA
Do.	do.	Plant at Vitoria, Alava Province	NA
Strontium	Solvay Minerales S.A.	Mines and plant at Escuzar, Granada Province	90
Do.	Canteras Industriales S.L.	Mine and plant at Montevives, Granada Province	50
Tungsten	Daytal Resources Spain S.L. (Almonty Industries Inc.)	Los Santos Mine, Salamanca Province	400
Zinc:			
Mine output, Zn content	Minas de Aguas Teñidas, S.A.U. (MATSA) (Trafigura Beheer B.V)	Mines and plant at Almonaster la Real, Huelva Province	58
Metal	Asturiana de Zinc S.A. (Glencore plc, 100%)	Electrolytic zinc plant at San Juan de Nieva, Castrillon, Asturias Province	511

[e] Estimated. Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF SWEDEN

By Alberto Alexander Perez

Sweden's geology forms part of the Fennoscandian Shield, an area of old crystalline and metamorphic rocks. The Fennoscandian Shield stretches across Sweden, Finland, and northwestern Russia. The most common soil type is till, which covers about 75% of the landscape, with common rocks being gneiss, granite, granodiorite, marble, and sandstone. Historically, the mining of ore and minerals has been an important part of the Swedish economy, and records indicate that metal mining has taken place in the area for at least the past 4,000 years. Sweden is one of the European Union's (EU's) leading producers of ores and metals (Geological Survey of Sweden, 2014a; Ministry of Enterprise, Energy and Communications Sweden, 2015, p. 9).

In 2014, Sweden produced 92% of the EU's iron ore, 19% of its base metals (of which 53.2% was zinc, 20.1% was lead, and the remainder was copper), and 18% of its precious metals (of which 98% was silver and 2% was gold). Sweden was the 10th-ranked iron ore producer in the world (Ministry of Enterprise, Energy and Communications Sweden, 2015, p. 51; Tuck, 2016).

The country also produced industrial minerals, including feldspar and limestone. Most notably, Sweden has alum shale-hosted uranium-molybdenum-vanadium deposits and Kiruna-type iron deposits in the north (Geological Survey of Sweden, 2014b). The country also has abundant hydroelectric power, although it also relies on nuclear power produced by 10 active reactors that produce 41.47% of its electricity (International Atomic Energy Agency, 2014; U.S. Central Intelligence Agency, 2015).

Minerals in the National Economy

In 2014, Sweden had a gross domestic product (GDP) of $472.4 billion, which was an increase of 1.2% compared with that of 2013. Sweden has reached an advanced state of industrialization; as such, the largest portion of its GDP was from the services sector. Production of mineral commodities accounted for 8% of Sweden's total commodity production and included mine-related production (accounted for 45% of the mineral commodity production), aggregates-related production (17%), and steel and metalwork production (38%). Total mineral commodities, including fuel-related minerals, contributed 14% of Sweden's total exports, of which 68.3% were steel and metalworks and 31.7% was mineral extraction. Of the total industrial workforce of Sweden, 6% was employed in the production of minerals and mineral products; of this subset, 71% was involved in steel production and metalworks; 15.8%, in mining; and 13.2%, in industrial mineral, ballast, and dimension stone production. In 2012 (the latest year for which data were available), Sweden's mineral industry production was valued at $5.24 billion. The mineral industry generated about 1% of the country's GDP (International Council on Mining and Metals, 2014, p. 31; Ministry of Enterprise, Energy and Communications Sweden, 2015, p. 51).

In 2014, significant mineral commodity exports to Sweden from the United States included, in order of value, metallurgical-grade coal (valued at $77 million), nuclear fuel material ($19 million), and coal and other mineral fuels ($1.7 million). Significant mineral commodity imports from Sweden to the United States included iron and steel mill products (valued at $541 million), petroleum products ($441 million), fuel oil ($297 million), and iron and steel products of advanced manufacture ($100 million) (U.S. Census Bureau, 2015a, b).

Government Policies and Programs

According to the regulatory guidelines issued by the Government, Sweden has two types of minerals: concession minerals and landowner minerals. The Mining Inspectorate of Sweden grants permits for the exploitation of concession mineral resources and sets the terms under which such a license will be issued. These terms are specified in the Minerals Act (1991:45), which dates from 1991. The minerals that are considered landowner minerals are extracted according to agreements between the landowner, who provides access to the land, and the enterprise or party that will extract the minerals. Both types of minerals have to meet the same specified requirements laid out in the Swedish Environmental Code and the Swedish Planning and Building Act (2010:900). Prior to extraction, the planned activities have to be tested against the provisions in these codes.

The Mining Inspectorate of Sweden, which is a part of the Geological Survey of Sweden (SGU), is the official institution responsible for issuing permits for exploration and mining. It also decides matters related to the Minerals Act (1991:45). SGU is the Swedish Government's authority on matters relating to geology and minerals management, both nationally and at the EU level. The SGU monitors the developments in mineral markets nationally and internationally, and it also produces and publishes statistics on mineral production in Sweden, including aggregates, peat, and other mineral commodities. The Mining Inspectorate of Sweden takes the following positions regarding Sweden's mineral sector: (1) it is crucial for employment in Sweden, particularly in those regions where the mines are located; (2) it is vital to the development of the mining equipment industry, which is an important sector of the Swedish industry, regardless of where in the country it is situated; (3) it is an important source of exports; and (4) it reduces the country's vulnerability in the event of international trade crises (Geological Survey of Sweden, 2014c; Ministry of Enterprise, Energy and Communications Sweden, 2015, p. 17).

Production

In 2014, the most significant changes (defined as greater than 10%) were in the production of mined zinc, which increased by 25.6%; mined lead, by 19%; mined silver, by 12%; and primary smelter copper, by an estimated 7.1%. The production of quartz and quartzite decreased by 28%; dolomite, by 14.8%; primary aluminum, by 13.7%; lime, by 13.2%; and feldspar, by 10% (table 1).

Structure of the Mineral Industry

The Kiruna Mine is thought to be the largest underground iron mine in the world in terms of the value of production. The Aitik copper-gold mine is the leading gold producer in Europe. According to the Ministry of Enterprise, Energy and Communications of Sweden and the SGU, there could be as many as 30 operational metal mines in Sweden by 2020 and about 50 by 2030 based on assessments of projects that have been given or have applied for permits and those that are being developed (Ministry of Enterprise, Energy and Communications Sweden, 2015, p. 11).

Sweden's mineral industry was composed mostly of privately owned companies, and it operated as a free market. The Government was the major equity owner of Luossavaara-Kiirunavaara AB's (LKAB's) iron ore operation, and it had significant ownership in the Svenskt Stal AB steel operation.

The leading privately owned mineral company operating in Sweden, in terms of value, was Boliden AB (Boliden), which produced principally copper, gold, lead, and silver. Boliden's major mines were the Aitik and the Kankberg Mines; Boliden also had a smelter and a refinery at Ronnskar.

The Canadian company Lundin Mining Corp. had significant operations in Sweden. The company produced lead, silver, and zinc from its Zinkgruven Mine at Ammeberg. HeidelbergCement AG of Germany owned Cementa AB, which had three cement plants in Sweden. The plants were located at Degerhamn, Skovde, and Slite, and they had a combined production capacity of about 3.4 million metric tons per year (Mt/yr). Table 2 is a list of the major mineral industry facilities in 2014.

Nordkalk AB, which was part of the Rettig Group of Germany, was a leading international producer of limestone, crushed and ground limestone, concentrated calcite, quicklime and slaked lime, as well as dolomite and wollastonite, which Nordkalk extracted as a byproduct of mining for limestone. Nordkalk had operations at 30 locations in 9 countries as well as mines in 5 countries. In Sweden, Nordkalks's limestone operations were located in Storugns (Nordkalk AB, 2014).

Commodity Review

Metals

Aluminum.—United Company RUSAL (RUSAL) of Russia stated that its wholly owned subsidiary in Sweden, Kubikenborg Aluminium AB (KUBAL), had decreased production in 2014 by 13.71% to 113,000 metric tons (t) from 131,000 t. RUSAL indicated that the reduction in output was owing to the failure of a T32 transformer in February 2014, and the subsequent functioning of the operation with low amperage and repeated emergency de-energizing of potline A. Throughout 2014, the affected area was stabilized and the potline was not shut down. A program for retrofitting the smelter's power supply system was implemented, which required potlines A and B to be combined. The retirement of all units began at the end of 2014 (United Company RUSAL, 2015, p. 14, 32).

Iron Ore.—Northland Resources S.A. (Northland) announced in December 2014 that it had failed to refinance its mining business and was filing for bankruptcy. Northland had been in financial difficulty since digging began in 2010, and in October 2014, the company stopped all operations and issued notices of termination to all employees. Northland laid off 240 mine workers and 191 ore truck drivers when the Kaunisvaara Mine closed (Barents Observer, 2014).

Luossavaara-Kiirunavaara AB (LKAB) decided to build and operate two new iron mines (the Mertainen and Leveaniemi Mines) in the Svappavaara field south of Kiruna. After several years of litigation, the Mertainen Mine, was granted permission to operate and start production in 2016, and the Levaniemi Mine was in the permitting process. The company's total investment, including investment in the existing Gruvberget Mine, was $1.33 billion, which was expected to result in the addition of 1,500 new jobs in Sweden (Euromines, 2014).

Silver.—Boliden announced that the expansion of the zinc-silver mine at Garpenberg had begun in March 2014, and production commenced. Boliden estimated that the full capacity of 2.5 Mt/yr of ore would be achieved by the end of 2015. Boliden reported that the mine's silver production increased to 218,000 kilograms (kg) in 2014 and that the mine employed 404 people (Boliden AB, 2015a, p. 36, 39; 2015b).

Industrial Minerals

Limestone.—SMA Mineral AB (SMA) produced principally limestone and lime; however, the company also produced dolomite, magnesium hydroxide, and magnesium oxide. SMA had operations in Boda and Rattvik. The company also owned Svenska Kyanite AB, which was a fully owned subsidiary that produced kyanite at Halskoberg (SMA Mineral AB, 2014).

Mineral Fuels and Other Sources of Energy

Peat.—Statistics Sweden and the Swedish Energy Agency announced that peat fuel production in Sweden decreased by 7% in 2014 and that horticultural peat production decreased by 17%. The agencies reported a 24% decrease in peat imports in 2014 compared with that of the previous year and a 10% decrease in exports of peat for the same period (Statistics Sweden, 2015, p. 4, 6, 9).

Outlook

The Government's mining strategy that was first drafted in 2013 was scheduled to be updated in 2015. The update would have the Government more actively involved in promoting the mineral resources of Sweden. The resources of Sweden are significant, and the Government has indicated that it considers mining to be an important part of the country's economy (Ministry of Enterprise, Energy and Communications Sweden, 2015). Although a small part of the country's GDP, mining is expected to remain an important component of Sweden's economy strategy.

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TABLE 1
SWEDEN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, metal:						
Primary		93,000	111,000	129,000	131,000	113,000
Secondary[e]		30,000	30,000	30,000	30,000	30,000
Total		123,000	141,000	159,000	161,000	143,000
Copper:						
Mine output, Cu content		76,500	83,000	82,422	82,904	79,681 [3]
Metal:						
Smelter:						
Primary		142,000 [r]	162,000 [r]	151,000 [r]	140,000 [r]	150,000
Secondary		40,000 [r]	45,000 [r]	56,000 [r]	59,000 [r]	60,000
Total		182,000 [r]	207,000 [r]	207,000 [r]	199,000 [r]	210,000
Refined:						
Primary		150,497	179,316	174,000 [r]	166,000	177,000
Secondary[e]		40,000	40,000	40,000	40,000	40,000
Total		190,497	219,316	214,000 [r]	206,000	217,000
Gold:						
Mine output, Au content	kilograms	6,242	5,935	6,015	6,530	6,849
Metal, primary and secondary[4]	do.	12,450	10,600	12,532	12,000 [e]	12,000 [e]
Iron and steel, metal:						
Iron ore concentrate and pellets:						
Gross weight	thousand metric tons	27,917	22,968	26,039	27,300	28,000 [e]
Fe content (60%)	do.	16,750	15,159 [5]	17,186	16,162	16,000 [e]
Metal:						
Pig iron	do.	3,447	3,240	2,805 [r]	2,896 [r]	3,078
Ferroalloys, ferrochromium[e]		32,000	32,000	32,000	32,000	32,000
Steel, crude	thousand metric tons	4,844	4,866	4,326	4,404	4,539
Lead:						
Mine output, Pb content		67,700	61,999	63,551	59,556	70,848
Metal, refined:[e]						
Primary		56,000	52,400	62,000	69,000	69,000
Secondary		40,000	41,000	44,000	45,000	45,000
Total		96,000	93,400	106,000	114,000	114,000
Nickel, metal, secondary[e]		50	--	--	--	--
Silver:						
Mine output, Ag content	kilograms	302,100	238,030	309,337	341,346	382,611
Metal, primary	do.	385,684	415,066	447,759	437,000	440,000 [e]
Zinc, mine output, Zn content		198,687	190,251	188,300	176,582	221,841
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	1,796 [3]	2,064	2,500 [r]	3,000	3,000
Feldspar, salable, crude and ground[e]		44,000	30,000	27,000	30,000	27,000
Lime[e]	thousand metric tons	700	960 [6]	960	806	700
Quartz and quartzite	do.	85	163	101	102	73
Stone:						
Dimension:						
Mostly unfinished	thousand metric tons	180	NA	NA	NA	NA
Granite	do.	124	92	79	90	88
Limestone	do.	43	23	21	21	22
Other	do.	6	67	82	82	82
Crushed:						
Dolomite	do.	450	483	429	445	379
Limestone		8,980	7,317	7,385	7,448	6,791
Sandstone	do.	20	NA	629	630 [e]	630
Undifferentiated	do.	30,000	NA	101	101 [e]	100
Talc, soapstone		4,000	3,000	--	--	--

See footnotes at end of table.

TABLE 1—Continued
SWEDEN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical	thousand metric tons	1,197	1,190	1,200	1,200	1,200
Peat:						
Agricultural use	thousand cubic meters	1,250	1,611	1,000	1,800	1,800
Fuel	do.	2,213	2,139	1,847	2,369	2,300
Petroleum, refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	3,978	3,139	4,490	3,577 [r]	3,600 [e]
Gasoline, motor	do.	32,740	33,799	37,048	28,945 [r]	29,000 [e]
Jet fuel	do.	1,424	1,496	1,898	1,314 [r]	1,400 [e]
Distillate fuel oil	do.	56,393	52,779	59,349	46,976 [r]	47,000 [e]
Residual fuel oil	do.	33,252	32,047	32,777	26,609 [r]	27,000 [e]
Other	do.	25,331	20,732	22,995	22,411 [r]	23,000 [e]
Total	do.	153,118	143,992	158,557	129,832 [r]	131,000 [e]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through November 15, 2015.

[2] In addition to the commodities listed, Sweden produced synthetic diamond, manufactured fertilizer, manufactured gas, granite, molybdenum, selenium, slate, steel semimanufactures, and sulfur, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Series was updated to include metal production from ores and electronics scrap recycling.

[5] Iron content reported to be 66%.

[6] Quicklime; estimate based on volume sold.

TABLE 2
SWEDEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Kubikenborg Aluminium AB (KUBAL) (United Company RUSAL, 100%)	Smelter at Sundsvall	125
Cement		Cementa AB (HeidelbergCement AG, 100%)	Plants at Degerhamn, Skovde, and Slite	3,400
Copper:				
Ore, copper content		Boliden AB	Mines at Aitik, Garpenberg, Kankberg, Kristineberg, Maurliden, Ostra, and Renstrom	NA
Metal		do.	Smelter and refinery at Ronnskar	240
Feldspar		Berglings Malm & Mineral AB (Omya GmbH)	Mines at Beckegruvan, Hojderna, and Limbergsbo	50
Do.		Silbelco Nordic AS	Mines at Forshammar	30
Ferroalloys		Vargon Alloys AB (Yildrim Group, 100%)	Plant at Vargon	255
Gold:				
Ore, Au content	kilograms	Dragon Mining Ltd.	Svartliden Mine, Skelleftea District	300
Do.	do.	Elgin Mining Inc.	Bjorkdal Mine, Skelleftea District	1,200
Do.	do.	Boliden AB	Mines at Aitik, Akerberg, Kankberg, Kristineberg, and Renstrom	4,000
Metal	do.	do.	Smelter and refinery at Ronnskar	15,000
Iron and steel		Svenskt Stal AB (Government, 48%)	Steelworks at Lulea and Oxelosund	3,900
Iron ore		Luossavaara-Kiirunavaara AB (LKAB) (Government, 98%)	Mines at Kiruna and Malmberget	37,000
Kyanite		Svenska Kyanite AB (Svenska Mineral AB, 100%)	Quarry at Halskoberg	10
Lead:				
Ore, lead content		Boliden AB	Mines at Garpenberg and Renstrom	100
Do.		Lovisagruvan AB	Lovisa Mine	3
Do.		Lundin Mining Corp.	Zinkgruvan Mine at Ammeberg	20
Metal		Boliden AB	Smelter and refinery at Ronnskar	30
Do.		do.	Smelter at Bergsoe	50
Lime		Svenska Minerals AB	Plants at Rattvik and Boda	250
Limestone		Kalkproduktion Storugns AB	Mines at Gotland Island	3,000
Do.		Nordkalk AB (Rettig Group, 100%)	Storugns	3,200
Marble	cubic meters	Borghamnsten AB	Quarry at Askersund	15,000
Petroleum, refined	42-gallon barrels per day	Preem AB (Corral Petroleum Holdings AB, 100%)	Refineries at Lysekil and Goteborg	210,000
Do.	do.	St1 Group Oy	Refinery at Goteborg	82,000
Do.	do.	AB Nynas Petroleum	Refineries at Gothenburg and Nynashamn	50,000
Silver:				
Ore, Ag content	kilograms	Lundin Mining Corp.	Zinkgruvan Mine at Ammeberg	25,000
Metal	do.	Boliden AB	Smelter and refinery at Ronnskar	408,000
Zinc, ore, zinc content		Boliden AB	Mines at Garpenberg, Laisvall, Langdal, and Renstrom	112
Do.		Lovisagruvan AB	Lovisa Mine	3
Do.		Lundin Mining Corp.	Zinkgruvan Mine at Ammeberg	78

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF SWITZERLAND

By Sinan Hastorun

Switzerland is a highly developed, landlocked, and mountainous country in Central Europe that borders the European Union (EU) member states of Austria, France, Germany, and Italy as well as the Principality of Liechtenstein. Few mineral commodities were mined in the country although more than 1,000 mineral deposits (in particular, iron ore and manganese ore) have been identified on Swiss territory. Switzerland's mineral output consisted almost exclusively of industrial minerals for the construction sector, refined precious metals, and refined mineral fuels. Industrial minerals that were mined and used on a large scale by industry were clay, gypsum, lime, and rock salt. Hydraulic cement and sulfur (from petroleum refining) were also produced. Construction aggregates continued to be an important commodity group in terms of gross value. The majority of domestically consumed stone was mined and processed in Switzerland. Locally produced nonmetallic minerals included raw materials for the brick-and-tile industry; lime and marl for the binder material industry; sand and gravel, dimension stone, and crushed stone for the construction industry; and refined petroleum products (Geology Portal, 2014b, c, d; Federal Department of Home Affairs, 2015).

The production and export of refined metals, in particular refined precious metals such as gold and silver, remained an important sector of Switzerland's economy; however, the quantity and value of production and exports of gold and silver decreased in 2014. The country remained the leading refiner of gold in the world in 2014, and an estimated 70% of annual global gold production was refined in Switzerland. Precious metal ores were not mined in the country, but there was increased exploration activity for gold and silver in 2014. Metal processing was limited mostly to secondary aluminum and steel production (Mariani, 2012; NV Gold Corp., 2014b; Berne Declaration, 2015, p. 7).

Transit trade of commodities, including nonfuel minerals and mineral fuels, formed an important segment of the national economy. The growth of the commodities sector has accounted for an estimated 50% of Switzerland's economic growth since 2010. This was largely owing to increased trading activity by Switzerland-based commodity companies that were among the world's largest, including Glencore plc, Gunvor Group Ltd., Mercuria Energy Group Ltd., Trafigura Beheer B.V., and Vitol Group. Switzerland accounted for an estimated 15% to 25% of the estimated $3 trillion annual global trade in commodities. The country's share of global commodities trading exceeded 15% for alumina, aluminum, coal, copper, cobalt, lead, petroleum, and zinc (Jung and Seith, 2012; Thut, 2013, p. 161–162).

Minerals in the National Economy

Switzerland's gross domestic product (GDP) increased by 1.9% in real terms in 2014, compared with a rate of growth of 1.8% (revised) in 2013. The country's nominal GDP was $675.3 billion (CHF642.3 billion[1]) in 2014. The slightly higher rate of growth was mainly owing to increased net exports and, to a lesser degree, increased domestic private consumption. The gross value added from manufacturing and construction increased by 2.0% in 2014, compared with a revised increase of 1.0% in 2013. Within manufacturing and construction, the value added from manufacturing increased by 2.4% compared with an increase of 0.7% (revised) in 2013, and that of construction increased by 2.1% compared with 2.0% in the previous year. The mining and quarrying sector contracted in 2014; its value decreased by 5.3% in 2014 compared with an increase of 1.9% (revised) in 2013 (Federal Statistical Office, 2015c, e, h, i; European Commission, 2015, p. 144; International Monetary Fund, 2015, p. 4).

Manufacturing made up about 19.0% of Switzerland's GDP in 2014, which was a slight increase from its 18.3% (revised) share in 2013. Construction accounted for about 5.3% of GDP in 2014 compared with 5.1% in the previous year. The metallurgy sector, which included the processing and refining of secondary metals, made up an estimated 0.7% of GDP. The mining and quarrying sector accounted for only about 0.12% of GDP in 2014, which was a slight decrease from 0.13% (revised) in 2013 (Cadot and Conde, 2013, p. 14; Federal Statistical Office, 2015e).

The precious metals refining and commodity trading sectors were two important components of the country's GDP. Gold and silver refining was estimated to have contributed about $525 million (CHF500 million) in gross value added, including both direct and indirect effects, which was equivalent to 0.08% of the gross national value added. The sector's output accounted for 11% of Switzerland's metallurgy sector's total and employed about 2,600 people directly or indirectly. The commodities trading sector accounted for an estimated 3.1% of GDP and employed about 10,000 people. The sector's net income of about $21 billion (CHF20.0 billion) was unchanged from its level in 2013. Mineral fuels were by far the largest commodity group in Switzerland's transit trade and accounted for about 75% of the total, which was followed by stone and metals, with about a 15% share (Berne Declaration, 2011, p. 41; Cadot and Conde, 2013, p. 14, 15, 16; Farge, 2013; Thut, 2013, p. 161; Swiss National Bank, 2015, p. 2, 3).

Government Policies and Programs

Mineral exploration and extraction in Switzerland was governed by the Bergregal, "principles of mining law." According to the Swiss civil code (Art. 664 ZGB), the Federal Government entrusted the 26 regional governments (Cantons) with legislative rights over public and unclaimed property, which included underground mineral resources. The Federal code only asserted that the interests and rights of landowners, the state, and license holders must be safeguarded. Cantons granted licenses for mineral exploration and exploitation based on their own planning and building regulations, environmental impact assessments, and safety regulations. Mineral regulations and procedures differed widely from one Canton to another, as each Canton had the authority to set its own mining law, to establish resource rights, and to issue mining licenses. The Federal Government did not own any territory in the Cantons or exercise any authority with regard to mineral resource regulations (Geology Portal, 2014a).

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[1] Where necessary, values have been converted from Swiss francs (CHF) to U.S. dollars (US$) at an average rate of CHF0.952=US$1.00 for 2014 and CHF0.964=US$1.00 for 2013.

Switzerland's regulatory framework for precious metals production and refining activities was governed by the precious metals control law, which was enacted in 1880 and subsequently amended in 1933 and 1994. The law of 1880 created the legal status of assayers in order to limit moral hazard in transactions. The revised law of 1994 created two categories of precious metal manufacturers with correspondingly different requirements. According to Articles 13–20, watch cases must be officially stamped by the Federal administration, while other precious metal products must bear a master's stamp to ensure full traceability. The Federal administration also controls international trade, and establishes the status and requirements of official assayers and trade assayers to control and certify the title of precious metals products (Cadot and Conde, 2013, p. 16).

In 2014, the Swiss Parliament began considering Energy Strategy 2050 to gradually phase out nuclear energy in Switzerland through the decommissioning of the existing five nuclear plants, to increase the use of hydropower and new renewable energy sources, and to improve energy efficiency in the country. In December 2014, the National Council, which is the lower house of Parliament, approved a proposed system to require operators to submit plans for improving the safety of reactors after 40 years of service. Subject to approval by the Swiss Federal Nuclear Safety Inspectorate (ENSI), a reactor's license would be renewed for 10 years, with the possibility of another 10 year extension. No licenses will be issued for the construction of new nuclear reactors (Swiss Federal Office of Energy, 2015c, d; World Nuclear Association, 2015).

Production

In 2014, refined gold and refined silver production both decreased substantially. Refined gold output was estimated to have decreased by about 27% and refined silver by about 10% compared with production in 2013. Crude steel and steel manufactures production decreased by about 4% each. Aluminum production was estimated to have increased by about 8%. Among industrial minerals, salt production decreased by about 40% and cement production by about 6%. Among refined petroleum products, kerosene output decreased by 58% and distillate fuel oil decreased by 15%. Residual fuel output increased by 8%. The country's secondary aluminum production was mainly exported to EU countries for use in the automotive industry. Its salt production was partly exported and partly domestically consumed (table 1).

Structure of the Mineral Industry

Switzerland's mineral producers were owned privately or by the Cantons. Table 2 is a list of major mineral industry facilities.

All four leading gold refiners were privately owned. Argor-Heraeus S.A. was owned by Heraeus Holding GmbH, Commerzbank International S.A., and Münze Österreich (the Austria Mint). Metalor Technologies S.A. was owned by Astorg Partners S.A. of France, and Produits Artistiques Métaux Précieux S.A. was a subsidiary of MKS S.A of Switzerland. Finally, Valcambi S.A. was a wholly owned subsidiary of European Gold Refineries Holding S.A., which was in turn majority owned by Newmont Mineral Holding B.V. of the United States (table 2; Gold Bars Worldwide, 2015a–d).

Many leading global commodity trading companies (by revenue) were either based or headquartered in Switzerland. These included Vitol Group, the world's leading petroleum trader; Glencore plc, the world's largest commodities trading company as well as a leading mining company; Gunvor Group, a leading petroleum, coal, and liquefied natural gas (LNG) trader; Trafigura Beheer, a leading petroleum and metals trader; and Mercuria Energy Group, a leading mineral fuels trader (Schneyer, 2011; Thut, 2013; Swiss Trading & Shipping Association, 2015).

Mineral Trade

Switzerland's trade surplus increased by 27.4% to reach a record-high level of $31.5 billion (CHF30 billion) in 2014. Exports increased by 3.5% to $218.8 billion (CHF208.3 billion), while imports increased by only 0.4% to $187.3 billion (CHF178.3 billion). Exports to all regions recorded an increase, with the exception of Australia and South America. The increase was the highest for exports to North America (10%), which was driven by higher exports to the United States (11%). Switzerland's imports from Asia increased by 6%; imports from China have doubled since 2010. The EU-28 continued to dominate Switzerland's trade (excluding gold bars, other precious metals, coins, and precious stones and gems), accounting for 54.7% of exports and 73.2% of imports in 2014 (Federal Customs Administration, 2015a, p. 1–4, 11; 2015b; Federal Statistical Office, 2015a, d).

Among mineral commodity exports, precious metals, semiprecious stones, and gemstones, made up 26.1% of Switzerland's total exports in 2014 and decreased by 42.3% compared with their level in 2013; raw materials and semifinished products, 12.6% (increased by 1.1%); and energy resources, including electrical energy, motor fuels, thermal fuels, crude petroleum, and basic products, 1.1% (decreased by 6%). Clays and dimension stone exports increased by 9.2% and aluminum, by 5.1%. Natural gas exports decreased by 28.8%; crude petroleum and distillates, by 8.1%; and iron and steel, by 5.3%. Among mineral commodity imports, precious metals, semiprecious stones, and gemstones made up 28.6% of Switzerland's total imports in 2014 and decreased by 39.2% compared with their level in 2013; raw materials and semifinished products, 16.4% (increased by 0.3%); and energy resources, including electrical energy, motor fuels, thermal fuels, crude petroleum, and basic products, 4.1%

(decreased by 16.4%). The decrease in energy imports was highest for thermal fuels (25.2%), followed by motor fuels (21.4%), electrical energy (11.9%), and crude petroleum and basic products (6.4%). Iron and steel imports decreased by 2% and nonferrous metals, by 0.9%. Clays and dimension stone imports increased by 2.2% (Federal Customs Administration, 2015a, p. 7, 9; Federal Statistical Office, 2015b, f, g).

Switzerland continued to be the world's top exporter and importer of gold, accounting for about 15% of the global trade. Gold was also estimated to be the country's leading export product (by value). In 2014, Switzerland exported about 1,745 metric tons (t) of gold valued at $68.3 billion (CHF65 billion). Gold exports decreased by about 45% by weight and by 37% by value compared with their levels in 2013. Switzerland's gold imports also decreased substantially in 2014. By weight, they decreased by 27% to about 2,236 t and by value, by 41% to $68.5 billion (CHF65.2 billion) (Federal Customs Administration, 2015c; Nguyen and Mariani, 2015).

Switzerland was also a leading exporter and importer of silver. The country exported about 2,124 t of silver valued at $1.3 billion (CHF1.2 billion) and imported about 1,168 t valued at $736.3 million (CHF701 million). Silver exports decreased by 12% by weight and by 30% by value in 2014, whereas imports decreased by 36% by weight and by 49% by value compared with their levels in 2013 (Federal Customs Administration, 2015c).

In 2014, Switzerland's exports to the United States totaled $31.2 billion, while its imports from the United States amounted to $22.2 billion. Mineral exports to the United States included precious metals other than gold ($444 million), nonmonetary gold ($419 million), iron and steel products ($75 million), iron and steel manufactures ($59 million), other petroleum products ($56 million), fuel oil ($21 million), bauxite and aluminum ($13 million), nuclear fuel materials ($8 million), and liquefied petroleum gases ($7 million). Mineral imports from the United States included nonmonetary gold ($6.9 billion), crude petroleum ($297 million), precious metals (other than gold) ($256 million), natural gas liquids ($112 million), coal and other fuels ($85 million), iron and steel products ($81 million), nonferrous metals ($75 million), iron and steel mill products ($12 million), copper ($9 million), nuclear fuel materials ($9 million), other petroleum products ($3 million), and aluminum and alumina ($2 million) (U.S. Census Bureau, 2015a, b).

Commodity Review

Metals

Aluminum.—Novelis Switzerland S.A., which was a subsidiary of Novelis S.A. of the United States, was the leading producer of aluminum sheet metal for the automobile industry in Europe. The company's Sierre plant produced aluminum sheet for the automotive industry with a casthouse that produced both standard single- and multi-alloy ingots. In December 2013, Novelis announced that it would increase the company's aluminum automotive sheet capacity in Europe to almost 350,000 metric tons per year (t/yr) in 2014 by building a new finishing line with a capacity of 120,000 t/yr at its Nachsterstedt plant in Germany and its global capacity to about 900,000 t/yr with the installation of a third line at its Oswego, New York, plant. In October 2014, Novelis opened the world's largest aluminum recycling center near its rolling mill in Nachsterstedt. The center had the capacity to process 400,000 t/yr of aluminum scrap (Novelis S.A., 2013, 2014, 2015).

Gold.—NV Gold Corp. of Canada continued to prospect for precious metals in the Medel Valley in southeastern Switzerland through its Surselva project. In October 2014, the company was reissued a 5-year exploration permit for gold and precious metals in a 224-square-kilometer area within the Communes of Disentis/Mustér, Medel/Lucmagn, and Sumvitg in the Canton of Graubunden. The new permit would be governed by the terms of the amended mining law in effect in each commune. In November 2014, NV Gold filed a new technical report on the Surselva project. Surface rock samples obtained during the initial surface reconnaissance program in 2011 yielded values of up to 17.4 grams per metric ton gold. The company planned additional surface exploration in 2015, with an initial drill program possibly in the second half of the year (NV Gold Corp., 2014a, b).

Aurania Resources Ltd. of Canada was engaged in copper, gold, and uranium exploration in southwestern Switzerland. The company held a 100% interest in three exploration projects—Marcottes, Month Chemin, and Siviez—in the Canton of Valais through its subsidiary AuroVallis SARL. In February 2014, the company reported that assays from initial exploration drilling on the Siviez uranium-copper-gold property, which consisted of four holes at a depth of 623 meters failed to encounter any substantial uranium mineralization. Aurania planned to undertake comprehensive structural mapping to better constrain future drilling and a second drill program for the Mont Chemin gold project in the summer. In November 2014, Aurania renewed its three exploration permits until June 2015. Under the Canton's mining law, the company could request an additional 5-year extension at that time (Aurania Resources Ltd., 2014a, b; 2015).

Switzerland had four of the world's largest gold refineries, in descending order of capacity—Balerna, Marin, Castel San Pietro, and Mendrisio. All four refiners were affiliated with the London Bullion Market Association (LBMA), which issued the quality certification for gold refiners through its Good Delivery List. They manufactured and exported gold bars and various other gold products from imported semimanufactured bullion, mine dore, coins and medals, jewelry, and scrap. Produits Artistiques de Métaux Précieux S.A., which operated the Castel San Pietro refinery, also refined palladium, platinum, rhodium, ruthenium, and silver for the silver and platinum-group-metals industries (Mariani, 2012; Gold Bars Worldwide, 2015a–d).

The criminal investigation into Argor-Heraeus was pending for alleged money laundering in connection with the alleged refining of gold originating from an armed group in the Democratic Republic of Congo [Congo (Kinshasa)]during 2004 and 2005. Argor-Heraeus indicated that it had ceased all commercial activity with the alleged shipper, Hussar Ltd. of the United Kingdom, and since 2005 had not accepted any material from Uganda for processing as a precautionary measure (Argor-Heraeus S.A., 2013; Miles and Farge, 2013; Trial, 2014).

Iron and Steel.—Stahl Gerlafingen AG recycled domestic and imported scrap steel in its Gerlafingen plant and produced about 662,000 t of structural and reinforcing steel. The company processed raw material extracted from buildings and used products into reinforcing steel with an iron content of about 98% (Stahl Gerlafingen AG, 2015a, b).

Swiss Steel AG was a leading supplier of engineering steel and free-cutting steel in the European long steel market. The company supplied steel produced at its Emmenbrucke plant to automobile, engineering, and apparatus construction industries. In 2014, Swiss Steel was in the process of testing a new technique to exploit secondary materials that used processed casting ladle slag as a fertilizer in agricultural applications. The company obtained ISO 50001 certification for its energy management system, which saved 100,000 kilowatthours of electricity per year (Schmolz and Bickenbach AG, 2015, p. 66, 67; Swiss Steel AG, 2015).

Industrial Minerals

Cement.—Three cement producers in Switzerland owned six integrated cement plants with a combined production capacity of 5.31 million metric tons per year (Mt/yr). Of these, Holcim (Schweiz) AG, which was a subsidiary of Holcim Ltd., operated three plants with a combined capacity of 3.40 Mt/yr. The Siggenthal plant was Holcim's and Switzerland's largest cement producing facility. Jura Cement Fabriken AG, which was a subsidiary of CRH plc. of Ireland, operated the Wildegg and Corneaux cement plants with a combined capacity of 1 Mt/yr. These two plants reportedly ran close to full production capacity in 2014. Ciments Vigier AG, which was a subsidiary of Vicat Group of France, operated the Reuchenette plant, which had a capacity of 0.91 Mt/yr (International Cement Review, 2015, p. 334–335).

In February 2014, Thorwesten Vent completed the assembly of a large-capacity (2,300-cubic-meter) silo for the storage of pulverized lignite at Holcim's Siggenthal plant. In May 2014, Jura Cement completed its 2-year waste-heat recovery project at the Wildegg plant, which was expected to enable the plant to generate 20% of its annual power requirement. The project was assisted by EKZ GETEC, which was a subsidiary of the Zurich Kanton powerplant. In August 2014, the Siggenthal plant resumed cement production with an activated carbon filter after a 5-month repair and reconstruction. A fire caused by self-igniting coal dust had damaged the equipment in February 2014, but production was not interrupted during reconstruction owing to the plant's conventional gas cleaning systems (Global Cement, 2014; International Cement Review, 2014; 2015, p. 334–335).

In April 2014, Holcim Ltd. announced that it would merge with Lafarge S.A. of France, which would create the world's largest cement producer. The two companies planned to divest plants in at least 13 countries to address market competition issues as required for regulatory approval. Two-thirds of the planned divestitures were expected to include facilities in Europe where the cement market had substantial overcapacity. In December 2014, the European Commission approved the acquisition of Lafarge by Holcim, subject to the divestment of Lafarge businesses in Germany, Romania, and the United Kingdom and of Holcim's operations in the Czech Republic, France, Hungary, Slovakia, and Spain (European Commission, 2014; Plimmer and others, 2014; Winters and de Beaupuy, 2014).

Gypsum.—Switzerland had substantial gypsum deposits; however, more than one-half of about 840,000 t of gypsum consumed domestically was imported. Gypsum was used in the form of raw material for the production of cement and finished products such as mortar, plaster, screeds, and wallboard. The country's gypsum stock was about 27 million metric tons and increased annually by about 600,000 t. About 240,000 t of gypsum left the building stock in Switzerland annually, which corresponded to about 30% of domestic consumption. Only a small portion of about 230,000 t of waste gypsum was being recycled currently (Baudirektion Kanton Zurich, 2014, p. 1, 3).

Salt.—Salines Suisses continued to be the only entity authorized to sell, trade, or import salt and salt mixtures with a sodium chloride content of at least 30% and solutions with a salt content of at least 18% in Switzerland. The company has held this position since 1973 owing to an agreement by all Cantons except Vaud, which transferred all rights and obligations regarding the salt trade to Salines Suisses. In July 2014, Saline de Bex SA, which was active in the extraction and production of salt as well as in the generation of electricity in the Canton of Vaud, joined Salines Suisses (Saline de Bex S.A., 2015; Salines Suisses, 2015).

Mineral Fuels and Other Sources of Energy

In 2014, Switzerland's total primary energy supply was provided by petroleum and petroleum products (52%), nuclear power (14%), natural gas (13%), hydropower (10%), other renewable energy (10%), and coal (1%). Among petroleum products, motor fuels accounted for 70% and fuel oils for the remaining 30%. Hydropower accounted for about 57% of the country's electricity generation and nuclear powerplants for about 38%. Switzerland was import dependent for 100% of its petroleum and natural gas supply (International Energy Agency, 2014, p. 436, 443; Orelli, 2015, p. 232; Swiss Federal Office of Energy, 2015a; 2015b, p. 2–6).

Natural and Shale Gas.—Switzerland was assumed to have shale gas deposits, but the use of fracking techniques to extract those resources were either prohibited by the Cantons or regulated by very strict rules. The country did not produce natural gas and imported 100% of its entire consumption, in descending order of volume, from the Netherlands, Russia, Norway, Germany, and Algeria (Orelli, 2015, p. 232).

Nuclear Energy.—Switzerland had five active nuclear reactors (Gösgen, Mühleberg, Leibstadt, Beznau I, and Beznau II) that supplied more than one-third of the country's energy supply. In accordance with gradual phasing out of nuclear energy as envisioned by the Energy Strategy 2050, the Mühleberg and Beznau I nuclear reactors were expected to be taken off the grid in 2019, followed by Beznau II in 2022, Gösgen in 2029, and Leibstadt in 2034. Gösgen's power capacity was uprated to 1,010 megawatt electric (MWe) in 2014 from 920 MWe following equipment replacement in 2013. BKW FMB Energy implemented safety upgrades at the 306 MWe Mühleberg reactor in October 2013 and also announced that it would be shut down in 2019 instead of 2022 as originally planned owing to political and regulatory uncertainty about nuclear energy in Switzerland. In May 2014, the citizens of the Canton of Bern voted against an early shutdown proposal for the Mühleberg reactor due to alleged safety concerns, thereby approving the planned 2019 closure date (World Nuclear News, 2014; World Nuclear Association, 2015).

Petroleum and Refined Petroleum Products.—Although Switzerland did not extract any crude petroleum, the country produced refined petroleum products at two refineries. With the exception of residual fuels, however, domestic refinery production was not sufficient to meet domestic demand—production covered 28% of diesel fuel consumption and 34% of gasoline consumption. Crude petroleum was imported primarily, in descending order, from Kazakhstan, Nigeria, and Algeria, while refined product imports were supplied by Germany, the Netherlands, Italy, France, and Belgium (International Energy Agency, 2014, p. 438).

Tamoil (Suisse) S.A.'s Collombey refinery, which was one of two petroleum refineries in Switzerland, continued to incur losses. In January 2015, Tamoil announced that it would suspend refining operations at Collombey. The company had reportedly invested more than $735 million (CHF700 million) since 2000 to increase the refinery's competitiveness and to improve its economic and environmental performance, most recently for maintenance in June 2013 when the Canton of Valais ordered the cleanup of the 50-year-old plant (Farge, 2012a–b; Swissinfo, 2015).

Varo Energy Holdings S.A., which was a joint venture of the Vitol Group and Atlasinvest, operated the Cressier refinery in Switzerland; it had acquired the refinery in June 2012 and restarted refining operations in July 2012. In July 2014, Varo Energy expanded its operations in the country by acquiring tank storage facilities in Eclepens, which was located near Lausanne, from Total S.A. of France and the latter's entire domestic end customer distribution and sales network for domestic heating oil and diesel. The acquisition was a part of Varo Energy's plan to become a leading midstream energy company across Northwest Europe and to extend its direct delivery of energy products to customers in Switzerland (Vitol Group, 2012, 2014).

Outlook

Precious metals refining and mineral commodity trading are expected to continue to be the two main mineral sector activities in Switzerland. The growth of the commodity trading industry may decelerate if rules are adopted to require disclosing of payments to foreign governments as proposed by the Swiss Federal Council. The production and exporting of refined gold and silver, in particular to countries in Asia, are projected to resume increasing in coming years after decreasing in 2014. Current gold, silver, and uranium exploration projects by NV Gold and Aurania Resources are at an early stage of identifying mineral deposits. Furthermore, the extraction of precious metal ores hinges on whether companies are able to receive approval for production in future referenda at the Cantonal level. Cement production may decrease if the newly merged Holcim Lafarge scales back operations in Europe as anticipated in order to address overcapacity in the continent's cement market. The exhaustion of limestone and marl reserves in quarries located near Switzerland's six cement plants may also significantly reduce the country's cement output. The production of refined petroleum products is likely to decrease substantially with the closure of one of the only two refineries in operation. In accordance with the Energy Strategy 2050, the composition of energy generation and energy consumption in Switzerland are expected to shift away from nuclear power to hydropower and other renewable energy sources (Hoffman, 2014; International Cement Review, 2015, p. 335).

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TABLE 1

SWITZERLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, secondary[e]	metric tons	130 [r]	130 [r]	130 [r]	130 [r]	140
Gold, refined	do.	2,330	2,670	2,260	3,080	2,240
Iron and steel, metal:						
Crude steel		1,320 [r]	1,400 [r]	1,450 [r]	1,530 [r]	1,475
Semimanufactures		1,140 [r]	1,240 [r]	1,280 [r]	1,345 [r]	1,285
Lead, refined, secondary[e]	metric tons	-- [r]	-- [r]	-- [r]	-- [r]	--
Silver, refined	do.	1,660	2,060	2,290	2,900	2,600
INDUSTRIAL MINERALS						
Cement, hydraulic		4,667	4,750	4,360 [r]	4,540 [r]	4,290
Gypsum		250 [e, r]	350	320	340 [e]	340 [e]
Lime[e]		85	85	85	118 [r]	120
Salt		679	501	528	652	390
Sulfur, from petroleum refining	metric tons	3,000 [e]	3,000 [e]	NA	NA	NA
MINERAL FUELS AND RELATED MATERIALS						
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	170	184	119	193	200
Gasoline	do.	1,319	1,263	1,028	1,388	1,421
Naphtha	do.	--	20	20	20	20
Kerosene	do.	64	81	38	38	16
Distillate fuel oil	do.	2,269	2,209	1,703	1,359 [r]	1,158
Residual fuel oil	do.	377	344	275	365	394
Other	do.	314	306	241	318	491
Total	do.	4,513	4,407	3,424	3,681	3,700

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. NA Not available. -- Zero.

[1] Table includes data available through January 20, 2016.

[2] In addition to the commodities listed, platinum and a variety of crude construction materials (common clay, sand and gravel, and dimension stone) were thought to have been produced, but output was not reported, and available information was inadequate to make reliable estimates of output.

TABLE 2
SWITZERLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Novelis Switzerland S.A. (Hindalco Industries Ltd., 100%)	Plant at Sierre	130
Do.		Constellium Valais SA	Plant at Steg	110
Do.		Do.	Plant at Chippis	70
Do.		Do.	Plant at Sierre	NA
Do.		Aluminium Laufen AG	Plant at Liesberg	26
Do.		Alu Menziken Extrusions AG (Montana Tech Components AG, 100%)	Plant at Reinach	15
Cement		Holcim (Schweiz) AG (Holcim Ltd., 100%)	Plants at Eclepens, Siggenthal, and Untervaz	3,400
Do.		Jura Cement Fabriken AG (CRH plc., 100%)	Plants at Corneaux and Wildegg	1,000
Do.		Ciments Vigier AG (Vicat Group, 100%)	Plants at Reuchenette	910
Copper, alloy	metric tons	Schmelzmetall AG	Refinery at Gurtnellen	2,400
Gold, refined	kilograms	Argor-Heraeus S.A. (Heraeus Holding GmbH, Commerzbank International SA, and Münze Österreich)	Refinery at Mendrisio	400,000
Do.	do.	Cendres+Métaux S.A.	Refinery at Biel-Bienne	NA
Do.	do.	Metalor Technologies S.A. (Astorg Partners SA)	Refinery at Marin	650,000
Do.	do.	Produits Artistiques de Métaux Précieux S.A. (MKS SA, 100%)	Refinery at Castel San Pietro	450,000
Do.	do.	PX Precinox S.A.	Refinery at La Chaux-de-Fonds	60,000
Do.	do.	Valcambi S.A. (Newmont Mineral Holding BV, 60.6%, and Private Equity, 39.4%)	Refinery at Balerna	2,000,000
Petroleum, refinery	barrels per day	Tamoil (Suisse) S.A. (Colony Capital LLC, 65%, and Government of Libya, 35%)	Refinery at Collombey	55,000
Do.	do.	Varo Energy B.V. (Carlyle International Energy Partners, 50%, and Vitol Group, 50%)	Refinery at Cressier	68,000
Platinum-group metals	kilograms	Produits Artistiques de Métaux Précieux S.A. (MKS Finance SA, 100%)	Refinery at Castel San Pietro	30,000
Salt		Salines Suisse (25 Cantons, except Vaud, 100%)	Saline plants at Riburg and Schweizerhalle	500
Do.		Saline de Bex S.A. (Canton of Vaud, 100%)	Saline mine and plant at Bex	50
Steel		Stahl Gerlafingen AG (Beltrame Group, 100%)	Plant at Gerlafingen	720
Do.		Swiss Steel AG (Schmolz and Bickenbach AG, 100%)	Plant at Emmenbrucke	300

Do., do. Ditto. NA Not available.

THE MINERAL INDUSTRY OF TAJIKISTAN

By Karine M. Renaud

Tajikistan is a primarily mountainous country that is home to the Pamir and Tien-Shan Mountains. It borders Afghanistan to the south, China to the east, Kyrgyzstan to the north, and Uzbekistan to the north and west. Tajikistan has more than 400 mineral deposits, including deposits of antimony, bismuth, fluorspar, gold, lead, mercury, molybdenum, natural gas, petroleum, tungsten, silver, and zinc. Some deposits have been explored and developed; however, many remained undeveloped owing to their location and depth. In terms of world production in 2014, Tajikistan ranked fifth in antimony and sixth in mercury. In addition, aluminum, cement, coal, copper, crude petroleum, gold, gypsum, natural gas, salt, sand and gravel, silver, and zinc were produced. Historically, Tajikistan has imported natural gas from Uzbekistan, but not in 2013 or 2014. as the two countries still had not reached an agreement on the price of natural gas imports. The gap in energy supply was made up by increased use of coal (table 1; Embassy of the Republic of Tajikistan in Swiss Confederation—Permanent Mission of the Republic of Tajikistan to the United Nations Office at Geneva, The, 2009; Ergasheva, 2014d; George, 2016; Guberman, 2016).

Minerals in the National Economy

In 2014, the gross domestic product (GDP) was reported to be \$8.6 billion[1] compared with \$8.5 billion in 2013, and real GDP growth was 6.7% in 2014 compared with 7.4% in 2013. Industrial production accounted for 12% of the GDP in 2014 compared with 12.6% in 2013; in nominal terms, it increased by 5.0% in 2014 compared with 3.9% in 2013, owing to the commissioning of new facilities, such as cement- and coal-production plants. Mining made up 13% of the value of industrial production in 2014 compared with 8.9% (revised) in 2013. In 2014, mineral sector revenue increased by 26% to 1.4 billion somoni (\$265 million) compared with 1.1 billion somoni (revised) (\$234 million) in 2013, which accounted for 13% of total industrial sector revenue. In 2014, mining and quarrying employment decreased by 12% to 10,600 employees compared with 12,000 employees in 2013 (MINEX Central Asia, 2014, p. 1; World Bank, The, 2014, p. 1; Agency on Statistics Under the President of the Republic of Tajikistan, 2015, p. 41, 78–79, 82).

According to the Agency on Statistics Under the President of the Republic of Tajikistan, the total value of foreign direct investment (FDI) in the first 6 months of 2014 was \$170 million. China accounted for 44.4% of total FDI in Tajikistan; Russia, 13.8%; the United Kingdom, 6.4%; the United States, 5.3%; Qatar, 2.8%; Iran, 1.4%; and Switzerland, 1.2%. The FDI flowed mainly into the mining sector (38.4%), the communications sector (20%), exploration activity (16.9%), and construction and repair activities (5.4%) (Chorshanbiyev, 2014).

Government Policies and Programs

In 2014, a memorandum of cooperation was signed by the Minister of Industry and New Technologies and Tachen International Company of XUAR Resources (Iachen Resources) of China. According to the memorandum, Tachen Resources was expected to invest \$400 million into development of the north Zarnisor deposit and construction of the China-Tajikistan industrial zone in Istikol. The total area of the China-Tajikistan industrial zone was estimated to be 0.69 square kilometer (km^2). The industrial zone would include a lead-zinc metallurgical complex and cement, chemical, and construction material enterprises, and was expected to be completed at the end of 2017 (Ministry of Industry and New Technologies of the Republic of Tajikistan, 2013e).

In 2013, the Ministry of Energy and Industry was renamed the Ministry of Energy and Water Resources. The Ministry of Industry and New Technologies was established in November and assigned responsibility for monitoring such industries as mining and metallurgy, machine manufacturing, construction materials, textiles, food processing, and coal mining. The Ministry of Industry and New Technologies implemented new programs, such as the program to develop gold and silver processing capacity from 2012 to 2016. The intent of the program was to increase the production of precious metals by identifying new gold and silver deposits, developing new mines, expanding the production capacity of existing facilities that produced gold and silver, and opening new facilities to produce gold and silver (Ministry of Economic Development of the Russian Federation, 2013b, p. 1; Ministry of Industry and New Technologies of the Republic of Tajikistan, 2013c, d).

Production

In 2014, cement production increased by 200%; zinc, by 95%; coal, 70%; antimony, 45%; natural gas, 38%; lead, 26%; gold, 25%; sand and gravel, 17%; and gypsum, 6%. The production of primary aluminum decreased by 44%; crude petroleum, by 10%; and silver, by 6%. Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

The total value of trade in 2014 was \$5.27 billion compared with \$5.31 billion in 2013; exports totaled \$977.3 million in 2014 compared with \$1.2 billion in 2013, and imports totaled

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[1] Where necessary, values have been converted from Tajikistani somoni (TJS) to U.S. dollars (US\$) at an average rate of TJS5.28=US\$1.00 for 2014 and TJS4.77=US\$1.00 for 2013.

$4.3 billion in 2014 compared with $4.2 billion in 2013. In 2014, the value of aluminum exports was about $234 million, which accounted for 23% of total exports compared with $370 million in 2013, which accounted for 32% of total exports. The decline in aluminum exports was owing to ongoing issues, such as limited power supply and financial pressure, at the Tajik Aluminum Co. (TALCO) plants. The country's main export partners were Switzerland (27%), Turkey (26%), Kazakhstan (18%), Iran (7%), Russia (5%), and China (4%) (Interfax, 2014a, p. 17; International Monetary Fund, 2014, p. 9; Agency on Statistics Under the President of the Republic of Tajikistan, 2015, p. 120–123, 124; Asian Development Bank, 2015, p. 129; Chorshanbiyev, 2015).

In 2014, imports of high-alumina clays decreased by 36% to $130.6 million from $202.5 million; and petroleum products increased by 30% to $511.0 million in 2013 from $393.3 million. The country's main import partners were Russia (28%), China (17%), Kazakhstan (16%), Latvia and Switzerland (5% each), Iran (4%), Turkmenistan (3%), and Ukraine and the United States (2% each) (Agency on Statistics Under the President of the Republic of Tajikistan, 2015, p. 124, 126).

Tajikistan's exports to the United States were valued at $3.6 million in 2014 compared with $672,000 in 2013. Iron and steel accounted for about $5,000 of this amount. In 2014, imports from the United States were valued at $24.5 million compared with about $51.9 million in 2013; steelmaking materials accounted for $109,000, iron and steel products, $3,000 (U.S. Census Bureau, 2014a, b).

Commodity Review

Metals

Aluminum.—In 2014, state-owned TALCO decreased aluminum production by 44% to 121,000 metric tons (t) from 216,369 t in 2013. The decrease was attributed to TALCO's need to adapt to an intermittent supply of raw materials, to interruptions in energy supply, to the lack of skilled workers, and to low global prices for aluminum [in December the London Market Exchange (LME) official price for aluminum was $2,050 per metric ton]. In August 2014, the Government and Glencore plc of Switzerland discussed Glencore's participation in modernizing TALCO (Asia-Plus, 2014c; Interfax, 2014a, p. 10; 2014b; Metal Bulletin, 2014, p. 12; Tajik Aluminium Co., 2014; Times of Central Asia, The, 2015).

Antimony.—In 2014, antimony production at the Anzobskii mining-beneficiation complex increased by 45% to 8,000 t of contained antimony from 5,500 t in 2013. The complex used only 50% of its designed annual capacity of 700,000 metric tons per year (t/yr) of antimony ore. According to the Ministry of Energy and Water Resources, Campus Commodities Inc. of the United States, which owned the Anzobskii complex, had invested $4.5 million in the construction of a metallurgical plant that would increase antimony metal production to 5,000 t/yr. The plant was expected to start operating in 2012; however, operations were postponed for unknown reasons (Ergasheva, 2013c).

Gold.—In 2014, Tajikistan's production of gold increased by 25% to 3,477 kilograms (kg) from 2,774 kg in 2013. The increase in gold production was attributed to increased gold output by companies such as the Tajik-China Mining Co. Ltd. joint venture JV Zarafshon Gold Company LLC (ZGC) (to 1,902 kg), the Government-owned Tilloi Tochik [Tajik Gold] (509 kg), the private company Odina (236 kg), the Tajik-Canada joint venture Aprelevka (450 kg), and artisanal miners (380 kg) (East Time, 2015).

In 2013, ZGC (the country's leading gold producer) modernized the infrastructure at the Jilau and the Taror Mines and the processing system at its plant in the Sughd region. As of 2014, the modernization of infrastructure at the Jilau Mine was complete and the construction of the Jilau 10,000-t/yr metal plant was completed and put into trial production. The modernization of the Taror Mine was still in progress. In 2013, the Chairman of Zijin Mining Group and the President of Tajikistan announced that, owing to the modernization of the operations, the output of gold would increase by 3.5 t/yr (Zijin Mining Group Co. Ltd. 2011; 2013a; 2013b, p. 25; 2014, p. 32; Sedova, 2014, p. 14).

In 2014, YanTai Yuancheng Gold Co. of China signed an agreement with the gold-mining joint venture Aprelevka to develop deposits at Aprelevka's licensed areas. YanTai Yuancheng Gold was expected to invest in modernization of the gold mine. Aprelevka was a joint venture between the Government (51%) and Central Asia Minerals and Resources plc of Canada through its subsidiary Gulf International Minerals Ltd. (49%). The agreement, signed in 1993, covered several deposits, including the Aprelevka, Beguly, Burgunda, Chashma-Dinar, Chorbi, Ikkizhilon, Kyzyl-Cheku, Nadak, and Okur deposits. The Aprelevka deposit consists of two mines, which are located about 50 kilometers (km) northeast of the city of Khujand and about 70 km east of the city of Kansai. The western pit was mined, but the eastern pit remained undeveloped. The highest grade of ore was contained in quartz-carbonate veins that occurred in shear zones. The lower grade ore occurred in a stockwork vein envelope that surrounded the higher grade ore. Aprelevka contracted BJ Drilling of Kyrgyzstan to begin drilling the Aprelevka East area in the fourth quarter of 2012. The drilling program was expected to continue through the second quarter of 2013; the objective of the program was to expand identified gold resources (Ministry of Industry and New Technologies of the Republic of Tajikistan, 2013b; Asia-Plus, 2014b; Gulf International Minerals Ltd., [undated]; Asia-Plus, 2014b).

State-owned Tilloi Tochik conducted a geologic survey of the newly discovered gold placer Sebi Kopa deposit, which is located in the Hovalgin region, Hatlonsk District. The company purchased $400,000 worth of equipment for washing gold-bearing sands from the Magadan mechanical plant at the site. In 2014, Tilloi Tochik was expected to start extracting gold at the Sebi gold placer Kopa deposit; however, no updated information was available (Ergasheva, 2013b, d; 2014e).

China Nonferrous Gold Ltd. (CNG) held an exploration permit and a mining license for the Pakrut License Area through its subsidiary LLC Pakrut. The Pakrut license area consists of the Pakrut gold deposit and a 63-km^2 exploration area, which is located in the metalliferous southern Tien-Shan fold belt. Pakrut's Joint Ore Reserves Committee (JORC) code-compliant estimate of the measured resources was 18.57 million metric tons (Mt) at a grade of 3.16 g/t gold; indicated resources were 10.02 Mt at a grade of 2.05 g/t gold; and inferred resources were 41.19 Mt at a grade of 1.64 g/t gold with a cutoff grade of 0.5 g/t gold. The feasibility study on developing the resources of ore-bearing zones 1 and 3, which are located at the southern and northwestern areas of the project, was carried out by Beijin General Research Institute of Mining and Metallurgy, and construction of the underground mine and the ore-processing plant was in progress. The initial production capacity of the Pakrut Mine was expected to be 660,000 t/yr of ore, which would increase to 1.32 million metric tons per year (Mt/yr) of ore in 2017. As of 2014, the exploration license had expired, and an application had been submitted to renew the license. The phase 1 production of 730,000 t/yr was expected to start in June 2015 (China Nonferrous Gold Ltd., 2013, p. 4; 2014, p. 7; SRK Consulting China Ltd., 2013, p.ii–iii).

Lead and Zinc.—For the first 6 months of 2014, 650,000 t of lead-zinc ore was mined, and 24,000 t of lead mine output (Pb content of ore), 39,500 t of zinc mine output (Zn content of ore) and 2,200 t of copper concentrate were produced. The Altyn-Topkan project, which is located in the settlement of Zarnisor, was operated by Tajik-China Mining Co. Ltd. and sponsored by Xinjiang Tacheng International Resources Co. Ltd. of China and the Government. The Minister of Energy and Industry and company officials discussed increasing the production capacity of the Zarnisor ore-processing plant and constructing a metallurgical plant in Sughd Province. China Global New Technology Imp. & Exp. Co., Ltd. of China, which was the main investor in Tajik-China Mining Co, would invest $500 million in the construction of a metallurgical plant. The production capacity was estimated to be 50,000 t/yr each for lead and zinc. The processing of lead was expected to start in 2016, and the processing of zinc, in 2017. The plant was expected to employ 1,300 people (Chorshanbiyev, 2013; Ergasheva, 2014a; Kazakhstan Today, 2014; Rafiyeva, 2014).

Silver.—In 2014, silver production decreased by 6% to 1,700 kg from 1,800 kg in 2013. In 2013, the Adrasmankii mining-beneficiation complex planned to increase production of silver and zinc by 15% in Eastern Konimansur; however, it stopped operating owing to the decrease in the world price of silver (from $19.50 per troy ounce in December 2013 to $16.50 per troy ounce in December 2014) and termination of the investment by Konimansur LC Co. of Kazakhstan, which was owned by Kazzinc Ltd. of Kazakhstan. The State Committee for Investment and Property Management was looking for a new investor to develop the largest silver deposit in the country, Konimansuri Kalon (Bolshoi Konimansur). As of 2014, the tender process of Bolshoi Konimansur was stopped. The Government planned to process 15 Mt/yr of ore and to develop the deposit based on world standards by using experienced geologists and engineers. The historical reserves were estimated to be 1 billion metric tons (Gt) at grades of 49 g/t silver, 0.38% zinc, and 0.49% lead. The new survey indicated reserves of 70,000 t of silver (Ergasheva, 2013a, 2014a; Regnum, 2014; Kitco Metals Inc., 2015).

Industrial Minerals

Cement.—In 2014, cement production increased to 1.15 Mt from 385,000 t in 2013 owing to large-scale construction projects, such as the Rogum hydropower plant, and increased construction of housing and recreation facilities. In 2014, cement was produced by two large cement plants—the Yovon cement plant and the JSC Tajikcement Ltd. plant. JSC Tajikcement, which was located in Dushanbe, was reopened in October 2013 after switching to coal fuel. The plant produced 178,200 t of cement in the first 10 months of 2014 (Ergasheva, 2013d, 2014b; Global Cement, 2013a, 2014b; Ministry of Economic Development of the Russian Federation, 2013b, p. 2; Nezavisimoye Mneniye, 2013).

In 2013, the Tajikistan-China joint venture Huaxin Gayur Cement Co. Ltd., which had been established by Huaxin Zhongya Investment (Wuhan) Co. Ltd. (a subsidiary of Huaxin Cement Co. Ltd.) and Gayur LLC, constructed a cement plant with a production capacity of 1 Mt/yr in the Yovon District of Khatlon Province. Huaxin Zhongya Investment (Wuhan) Co. held 75% interest and Gayur held 25% interest in Huaxin Gayur Cement Co. The estimated cost of construction of the coal-powered plant was $110 million. For the first 10 months of 2014, the Yovon plant produced 760,000 t of cement. Coal was obtained from the Fon-Yaghnob and the Ziddi coalfields. The plant employed 534 workers, and 80% were residents of Tajikistan (Global Cement, 2013b; Zangli, 2013; Asia-Plus, 2014d).

In 2014, Huaxin Zhongya Investment (Wuhan) Co. Ltd. of China and Gayur started construction of two new cement plants in northern Tajikistan. The Gayur-Sughd Cement plant, which was expected to be built in Ghafurov District, would have a production capacity of 1.2 Mt/yr. The cost of construction was estimated to be $100 million. The first unit of the plant was expected to be commissioned in 2015, and the second unit, in 2016. The second plant, the Chjuntsay-Taboshar cement plant, was expected to have a production capacity of 0.6 Mt/yr and was expected to be completed in 2015 (Global Cement, 2014a).

Mineral Fuels

Coal.—In 2014, coal production increased by 70% to 878,100 t from 515,600 t in 2013 owing to demand from factories that were converting from natural gas to coal and the construction of thermoelectrical plants. Fon-Yaghnob was the leading coal producer in Tajikistan with estimated resources of 1 Gt. In October 2012, Kaisun Energy Group Ltd. of China was awarded a mining license for the eastern zone of the Fon-Yaghnob deposit. Production started in January 2013, and 33,460 t of coal was extracted during the year. The company owned mining rights for three other mines—the Kaftar-Hona anthracite deposit, the Zeddi coal deposit, and the Mienadu coal deposit. In 2014, Fon-Yaghnob produced 73% of the total coal production in Tajikistan (Kaisun Energy Group Ltd., 2012, p. 5; 2013, p. 5; Ministry of Industry and New Technologies of the Republic of Tajikistan, 2013a; Ergasheva, 2014c; Mangazeya, 2014; Sedova, 2014, p. 15; Trend, 2014).

Natural Gas and Petroleum.—In 2014, China National Petroleum Corporation (CNPC), Edgo Energy of Jordan, Gazprom Neft PJSC of Russia, and Tethys Petroleum Ltd. of the United Kingdom were engaged in developing oil and gas reserves in Tajikistan. Edgo Energy signed a production-sharing agreement (PSA) with the Ministry of Energy and Industry. Under the agreement, Edgo Energy was given a 7-year exploration license for prospecting and a 30-year license for extracting hydrocarbons (with two 5-year extension) in the promising Surkhsimo and Qarordon Blocks (formerly Karadum and Kyziltumshuq). Both blocks are located close to the Tajikistan-Afghanistan border and are part of the Tajik hydrocarbon basin. In 2014, Edgo Energy signed a service agreement with Klarenco Oil and Gas Consulting of Russia to conduct and integrate a data review of all historical geologic and seismic exploration and production logs in the areas (Natural Gas Asia, 2013; Edgo Energy, 2014; Sedova, 2014, p. 13).

In 2013, the Government of China and the Government of Tajikistan agreed to construct a natural gas pipeline that would deliver natural gas from Turkmenistan through Tajikistan to China. In 2014, CNPC Trans-Asia Gas Pipeline Co. Ltd. and Tajiktransgaz signed an agreement to jointly construct Line D, which was expected to supply an additional 25 billion cubic meters per year of natural gas to China. Construction was expected to start in 2014 and was expected to be completed in 2016 (Natural Gas Asia, 2014a, b).

In 2013, Tethys Petroleum Ltd. signed a memorandum of understanding, through its subsidiary Kulob Petroleum Ltd., with CNPC, Total S.A. of France, and the Government of Tajikistan. Tethys Petroleum held 28.3% interest in the Bokhtar PSC, and CNPC and Total S.A. each held 33.33% interest. The Bokhtar PSC covers 35,000 km^2 in the Afghan-Tajik portion of the Amu-Darya region, in Cretaceous and Jurassic reservoirs west of the Pamir Mountains. Resources available through the Bokhtar PSC were estimated to be 27.5 billion barrels of oil equivalent, 3.2 trillion cubic meters of natural gas, and 8.5 billion barrels of oil. In December 2014, the joint venture of Tethys, Total, and CNPC, as a Bokhtar Operating Co., signed a contract to acquire additional seismic data from Tethys to supplement seismic data acquired previously from Tethys. The data would assist in identifying the best location to drill the first well; drilling was expected to begin by the end of 2015 (Natural Gas Asia, 2012; Tethys Petroleum, 2013; 2014a, p. 56; 2014b; Total S.A., 2013; Sedova, 2014, p. 13).

Gazprom's exploration licenses for hydrocarbons in the Western Shaambary and the Sarykamysh areas were extended for 5 years. In 2014, Gazprom completed the drilling of a prospecting natural gas well (Shakhrinav-1p) of 6,450 meters (m) depth at the Sarykamysh site. The data collected during drilling provided additional information about the structure of the area that could be helpful for further exploration. The reserves were estimated to be 18 billion cubic meters. Gazprom was expected to receive licenses for new prospects (Collins and White, 2013, p. 1; Gazprom, 2014, p. 61)

In 2014, the Government and Limited Liability Co. HELI of China signed an agreement to construct an oil refinery in the Danghara Free Economic Zone. The construction cost was estimated to be $60 million for the first stage of the project and between $300 million and $500 million for the second stage of the project. The production capacity of the oil refinery was expected to be 500 t/yr, and the refinery would employ 200 people. In the second stage of the project, the capacity of the refinery would increase to 1.2 Mt, and the refinery would employ 500 people (Asia-Plus, 2014a).

The only oil refinery in Tajikistan was located in Tursnzoda, a town in the Shahrinav District. It had a production capacity of 456,000 barrels per year (bbl/yr) of refined petroleum. A new oil refinery was being constructed by the open joint-stock company Naftrason in Kanibadam City, Sughd District. The new refinery was expected to be operational in September 2014 and to have a production capacity of 513,000 bbl/yr of refined petroleum. The refined petroleum was expected to be exported to Kazakhstan and Russia. As of 2014, no updated information was available concerning the construction of the oil refinery (Ministry of Economic Development of the Russian Federation, 2013a, p. 2).

Outlook

Tajikistan relies heavily on foreign investments and loans for development of infrastructure projects and mineral industries. At present, foreign companies are enagaged in the development of coal, gold, and silver deposits and in the renovation and construction of cement plants. Tajikistan also is engaged in the development of its petroluem and natural gas reserves, which could help the country address energy shortages, stabilize energy supplies to industries, and prevent long-term environmental problems associated with the use of coal.

Given these efforts, it is likely that Tajikistan will be able to increase its output of gold and continue to expand production of cement, coal, natural gas, and petroleum.

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TABLE 1
TAJIKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
METALS						
Aluminum, primary		348,850	278,000	272,500	216,369	121,000
Antimony, Sb content of ore		3,000 [r]	6,000 [r]	6,600 [r]	5,500 [r]	8,000
Copper, Cu concentrate		--	--	--	--	2,200 [3]
Gold, Au content of ore	kilograms	2,049	2,240	2,400 [r]	2,774 [r]	3,477
Lead, mine output, Pb content of ore		4,000 [r]	9,000 [r]	12,000 [r]	19,000 [r]	24,000 [3]
Mercury, Hg content of ore		30	30	32	34	35
Silver, Ag content of ore	kilograms	2,651	1,764	1,767	1,800 [r]	1,700
Zinc, mine output, Zn content of ore		--	10,000	20,000	20,000	39,500 [3]
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	288	299	251	385 [r]	1,150
Gypsum		15,000	11,000	14,000	12,200 [r]	12,900
Salt		52,000 [e]	27,000 [e]	27,954	31,800 [r]	32,300
Sand and gravel	cubic meters	NA	8,800	2,000	264,000 [r]	309,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous and lignite		199,700	236,000	412,000	515,600	878,100
Gas, natural	thousand cubic meters	22,800	18,800	11,170	2,100 [r]	2,900
Petroleum, crude:						
In gravimetric units		27,000	28,000	30,000	27,000	24,000
In volumetric units	42-gallon barrels	78,500	82,069	86,419	79,169 [r]	71,049

[e] Estimated; estimated data are rounded to no more than three significant digits. [r] Revised. NA Not available. -- Zero.

[1] Table includes data available through August 6, 2015.

[2] In addition to the commodities listed, Tajikistan has produced a number of other mineral commodities, but available information was inadequate to determine if production was still continuing.

[3] Production figurs are for first 6 months of the year.

TABLE 2
TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Aluminum	Tajik Aluminium Co. (TALCO) (Government, 100%)	Tursunzade smelter	517,000
Antimony, ore and concentrate	Anzobskii mining-beneficiation complex (Comsup Commodities Inc., 100%)	Dzhizhikrutskoye antimony-mercury deposit	350,000
Antimony, metal	Isfara hydrometallurgical plant (Government, 100%)	Isfara	500
Arsenic	Mosrif deposit	NA	NA
Bismuth	Isfara hydrometallurgical plant (Government, 100%)	Isfara	500
Do.	Leninabad mining-beneficiation complex (Government, 100%)	Yuzhno-Yangikanskiy deposit	25
Bismuth, copper, fluorspar, gold, silver, zinc (ore processing)	Adrasmanskii mining-beneficiation complex (Government, 100%)	Kanimansurskoye deposit	650,000
Boron	Yakarkharskoye deposit	Badakhshan region	NA
Cement	JSC Tajikcement Ltd.	Dushanbe	1,200,000
Do.	Yovon Cement (Huaxin Gayur Cement Co. Ltd. and Gayur LLC)	Yovon District, Khatlon Province	1,000,000
Do.	Ghayur-Sughd Cement (Tajik Ghayur Co. and Hauksin Central Asia Investment)	Ghafurov District	1,200,000
Do.	Chjuntsay-Taboshar Cement	NA	600,000
Do.	LLC Tojikiston	Kharangon village, Varzob District	70,000
Do.	Isfarinsky Cement	Isfarinsky region	1,000,000
Do.	Sarabansky Cement	NA	70,000

See footnotes at the end of table

TABLE 2—Continued
TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity^e
Coal		Kaisun Energy Group Ltd.	UP Fong-Yaghnob, Pyandzh region	50,000
Do.		Isfara hydrometallurgical plant (Government, 100%)	Isfara	300,000
Do.		OJSC Angisht	Shurob region	32,000
Do.		do.	Shurob brown coal deposit	NA
Do.		SP Anzob	do.	NA
Copper-lead-zinc		Leninabad mining-beneficiation complex (Government, 100%)	Yuzhno-Yangikanskiy deposit	NA
Dolomite		Yavan electrochemical complex	Pashkharvoskoye deposit	NA
Fluorspar, concentrate		Takob mining-beneficiation complex	Takob and Krasnye Kholmy deposits	60,000 [2]
Gold, in ore	kilograms	Aprelevka joint venture (Government, 51%, and Central Asia Minerals and Resources through subsidiary Gulf International Minerals Ltd., 49%)	Aprelevka deposit	200
Do.		Odina	NA	NA
Do.	kilograms	Darvaz joint venture	Yak-Suyskoye deposit, Khatlon Province	2,000
Do.		OOO Takom Gold	NA	NA
Do.		Tilloi Tochik	NA	NA
Do.	kilograms	JV Zarafshon Gold Company LLC (Zijin Mining Northwest Co. Ltd., 75%, and Government of Tajikistan, 25%)	Jilau, Khirskhona, Olympiyskoye, and Taror deposits, Sughd Province	828,000
Do.	do.	China Nonferrous Gold Ltd., through subsidiary LLC Pakrut, 100%	Pakrut gold project, southern portion of the Tien Shan Fold Belt	728
Gold, ore processing	do.	Kansayskaya factory	Aprelevka, Burgunda, Kyzyl-Chek, and Shkol'noye deposits	243,000 [2]
Do.		Vostokredmet refinery	Qizfaquz	NA
Lead-zinc		Adrasman mining-beneficiation complex (Government, 100%)	Adrasman, Sughd Province	NA
Do.		Kansayskoye mining complex	Karamazor region	NA
Do.		Takaeliyskiy metallurgical complex	NA	NA
Do.		Zarnisor Shimoli (Tajik-China Mining Co. Ltd.)	Northern Altyn-Topkan and Pay Buloq	328,000
Do.		Tibet Summit Industry Co.	Altyn-Topkan	NA
Limestone		Dushanbe cement complex	Kharangonskoye deposit	NA
Clays (loam)		do.	Varzobskoye Ushchel'ye deposit	NA
Marble		Dal'yan Bolo deposit	Ganchinskiy region	NA
Do.		Dashtak deposit	Darvaz region	NA
Do.		Jilikul deposit	Sughd Province	NA
Mercury		Anzobskii mining-beneficiation complex (Comsup Commodities Inc., 100%)	Dzhizhikrutskoye antimony-mercury deposit	35
Petroleum		Beshtentyakskoye, Kichik-Belskoye, Shaambary, and Uzunkhorskoye deposits	Southern Tajik depression	200,000
Petroleum, refined	42-gallon barrels	NA	Turshzoda town, Shahrinav district	456,000
Do.	do.	OJSC Naftrason	Kanibadam City, Sughd Province	513,000
Salt		Ashtskiy plant	Kamyshkurganskoye deposit	NA
Do.		Khoja-Sartez, Samanchi, and Tanabchi deposits	NA	NA
Do.		Voseyskiy plant	Khodzha-Muminskoye deposit	NA
Do.		Yavan electrochemical complex	Tut-Bulakskoye deposit	NA

See footnotes at end of table.

TABLE 2—Continued
TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Silver	kilograms	JV Zarafshon Gold Company LLC (Zijin Mining Northwest Co. Ltd., 75%, and Government of Tajikistan, 25%)	Jilau, Sughd Province	4,000
Do.	do.	do.	Taror deposits, Sughd Province	700
Do.		Adrasman mining-beneficiation complex (Government, 100%)	Adrasman, Sughd Province	NA
Do.		Aprelevka joint venture	Aprelevka deposit	NA
Do.		Kanjol ore field (Nukrafom Co.) (Silverhill Resources Ltd.)	Gafurov District, Sughd Province	NA
Do.		Kytco BV	Akjilga	NA
Sand and gravel	thousand cubic meters	Anvar LLC	NA	40,000
Strontium, ore		Chaltash, Chilkutan, and Davgir deposits	Khatlon Province	180,000

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and locations.

[2]Capacity estimates are totals for all enterprises that produce the commodity.

THE MINERAL INDUSTRY OF TURKEY

By Sinan Hastorun

Turkey is an emerging market economy and European Union (EU) candidate country that is strategically located in both southeastern Europe and southwestern Asia. Turkey's economy was the 17th largest in the world in 2014. The country's real gross domestic product (GDP) increased at an average annual rate of 4.7% between 2002 and 2014, although the rate for 2009–14 slowed to 3.7%. Turkey's mineral sector had increased its output and exports significantly since 2002 and attracted higher levels of foreign direct investment (FDI), but all three (output, exports, and FDI) decreased in 2014. The country's construction and infrastructure development, which drove economic growth, led to significant increases in imports of mineral fuels, which contributed to a larger trade deficit. Turkey also remained partially import dependent for other mineral commodities, such as iron and steel, although these commodities were also produced domestically. Many of the mineral resources remain undeveloped, particularly those of copper, gold, lead, nickel, silver, and zinc, and particularly those located in eastern Turkey. Although not resource rich in mineral fuels except for coal, Turkey had become a key energy transit corridor for multiple operational and planned hydrocarbon pipelines between the energy-rich countries of the Caspian Basin and the Middle East, and the energy-consuming countries of the EU owing to its unique geographic location between Europe and Asia (Arseven and Ersin, 2015a; European Commission, 2015a; Investment Support and Promotion Agency [Turkey], 2015b; Matthews and Incesulu, 2015; U.S. Department of Commerce, 2015; U.S. Department of State, 2015; U.S. Energy Information Administration, 2015; World Bank Group, 2015b).

Turkey has a diverse mineral industry that produces more than 50 mineral commodities from about 4,500 known mineral deposits, including metals and industrial minerals. In 2014, Turkey was the world's leading producer of boron minerals (accounting for 70% of world production), perlite (40%), and pumice and pumicite (31%). It was also the world's second-ranked producer of feldspar (accounting for 23% of world production) after Italy and of magnesium compounds (9%) after China; the fourth-ranked producer of chromium (10%) and cement (2%); the fifth-ranked producer of bentonite (4%); the eighth-ranked producer of barite (3%) and crude steel (2%); and the ninth-ranked producer of kaolin (4%). Turkey was also Europe's top producer of cement and gold and its second-ranked producer of steel after Germany. The country was also the leading exporter of boron, marble, and travertine in the world. Turkey was a significant source of value-added metals and industrial mineral commodities, such as cement and steel, accounting for 2% of world production of both commodities. The amount of mineral fuels produced in Turkey was small by regional standards and insufficient to meet domestic consumption of petroleum and natural gas (table 1; Arseven and Ersin, 2015a, b; Çelik İhracatçıları Birliği, 2015; Enerji Piyasası Düzenleme Kurumu, 2015a, b; Eti Maden İşletmeleri Genel Müdürlüğü, 2015a, p. 18; Matthews and Incesulu, 2015; U.S. Energy Information Administration, 2015; World Steel Association, 2015, p. 1–2; Bennett, 2016; Bray, 2016; Crangle, 2016a, b; Flanagan, 2016; McRae, 2016; Papp, 2016; Tanner, 2016; van Oss, 2016).

Reserves and Resources

Turkey is endowed with a variety of minerals owing to the complex geologic structure of the Anatolian Peninsula, which is a part of the seismically active Alpine-Himalayan orogenic belt. The tectonic structure of the country encompasses multiple fault lines, which makes mineral exploration and extraction relatively difficult because of the need to drill deeply for ores; nonetheless, an estimated 77 globally traded mineral commodities have been identified in Turkey's territory. The U.S. Geological Survey estimates that Turkey holds the world's largest reserves of boron and perlite. It also holds the world's third-largest reserves of barite and fourth-largest reserves of magnesite and feldspar. According to the Government of Turkey, the country contained 5,690 million metric tons (Mt) of perlite, 5,161 million cubic meters of marble, 3,066 Mt of boron, 251 Mt of bentonite, 239 Mt of feldspar, 111 Mt of magnesium compounds, 89 Mt of kaolin, 35 Mt of barite, 26 Mt of chromium, 3.2 Mt of manganese, and 380,000 metric tons (t) of thorium. The country also contained an estimated 15.8 billion metric tons (Gt) of dolomite, 13.3 Gt of lignite coal, 5.7 Gt of salt, 2.3 Gt of quartzite, 1.3 Gt of quartz sand, and 1.1 Gt of hard coal (Maden Tetkik ve Arama Genel Müdürlüğü, 2002, 2011, 2015b; T.C. Ekonomi Bakanlığı, 2014a, b; Arseven and Ersin, 2015a, b; Matthews and Incesulu, 2015, p. 188; Bennett, 2016; Bray, 2016; Crangle, 2016a, b; McRae, 2016; Tanner, 2016).

Minerals in the National Economy

In 2014, Turkey's real GDP increased by 2.9% compared with a 4.2% rate of growth in 2013. The deceleration of economic growth was owing mainly to a slowdown in the growth of private consumption and investment. Net exports contributed positively to the country's economic growth in 2014, whereas they had subtracted from it in previous years. The nominal GDP in 2014 was $798.4 billion compared with $823.2 billion (revised) in 2013 (European Bank for Reconstruction and Development, 2015; European Commission, 2015b, p. 132; Türkiye Istatistik Kurumu, 2015a; World Bank Group, 2015a; 2015b, p. 2).

The mining and quarrying sector accounted for about 1.5% of the nominal GDP in 2014, which was a slight increase compared with its 1.4% share in 2013. The gross value of all mineral-sector-related activity was estimated to constitute about 3% of the nominal GDP because the mining and quarrying figures include only raw material extraction and not production of value-added processed mineral commodities, such as aluminum, boron chemicals, cement, refined copper, glass, and steel, or coal-based power generation. Ore processing in Turkey was limited, however, by relatively high energy costs owing in large part to the country's continued reliance on imported mineral fuels. The real gross value of the mining and quarrying sector increased by 5.6% to reach $11.6 billion in 2014. The real gross value of manufacturing (including mineral processing) increased by 3.7% and accounted for 24.2% of Turkey's GDP in 2014 compared with 24.0 % in 2013 (Engineering and Mining Journal, 2014, p. 86; Maden İşleri Genel Müdürlüğü, 2015d; Matthews and Incesulu, 2015, p. 165; Türkiye Istatistik Kurumu, 2015b).

Total FDI inflows into the Turkish economy (excluding real estate) decreased to $8.7 billion in 2014 from $9.9 billion in 2013. FDI inflows to Turkey's mining and quarrying sector, on the other hand, increased substantially to $449 million in 2014 (the sector's highest FDI inflow on record) from $242 million in 2013 and accounted for 5.2% of the country's total FDI inflows. The manufacturing sector received $2.9 billion in FDI inflows, accounting for 33.3% of total FDI in 2014 compared with $2.2 billion in 2013. Within the manufacturing sector, the manufacture of coke, refined petroleum products, and nuclear fuel registered FDI inflows of $100 million in 2014 compared with $236 million in 2013; the manufacture of base metals and fabricated metal products, $129 million compared with $100 million in 2013; and the manufacture of other nonmetallic mineral products, $158 million compared with $29 million in 2013 (Investment Support and Promotion Agency, 2015a).

Government Policies and Programs

Mineral exploration and extraction activities in Turkey are regulated by Mining Law No. 3213 of June 15, 1985, and the Mining Activities Regulation of February 18, 2015, which was the latest amendment to the original law with regard to transferability of mining licenses, reporting of mining activities, mine supervision, and license fees. Regulations on mineral sector activities included the Regulation on the Implementation of Mining Activities of November 6, 2010, and the Regulation on Mining Activity Permits of June 21, 2005. Under Article 4 of the Mining Law, all minerals are owned by the state. Under Article 14, the state may authorize third parties to undertake mining activities and provide permits and licenses to state institutions and organizations (Arseven and Ersin, 2015a, p. 1–2; Matthews and Incesulu, 2015, p. 165).

Under Article 2 of the Mining Law, all natural resources with commercial value are regarded as minerals and are subject to licensing procedures, with the exception of natural gas and petroleum, which are subject to different regulations. The law classifies minerals into five groups, which are subject to different exploration, operating, and licensing procedures. Group I covers (a) sand and gravel used in construction and roadworks, and (b) brick and roofing tile clay, cement clay, marl, pozzolanic rocks, and rocks used in the cement and ceramic industries. Group II covers (a) crushed stone derived from andesite, basalt, calcite, dolomite, granite, and limestone, and (b) dimension stone, such as andesite, basalt, granite, marble, and travertine. Group III covers carbon dioxide, hydrogen sulfide, and salt. Group IV covers (a) minerals used as raw materials for industry, including boron, calcium, lithium, and sodium; (b) minerals that are energy sources, including anthracite and lignite coal; (c) metals, including copper, gold, iron, manganese, nickel, platinum, silver, and zinc, and rare-earth minerals; and (d) radioactive minerals, such as radium and thorium. Group V includes precious gemstones, including diamond and sapphire (Arseven and Ersin, 2015a, p. 2; Matthews and Incesulu, 2015, p. 165).

Under Article 6 of the Mining Law, the state may grant mining rights to Turkish citizens, companies incorporated under Turkish law (including subsidiaries of foreign companies), and authorized public entities and institutions. There are two types of licenses for prospecting and operating mines: exploration licenses and operating licenses. The exploitation of Groups I, II(a), and II(c) mineral deposits do not require an exploration license. For all other groups, however, an exploration license is required as the first step for commencing any mining operations. Exploration licenses are obtained through a tender, with the exception of Groups II(b) and IV minerals, which are awarded on a first-come-first-served basis. Exploration licenses grant the license holder a 1-year pre-exploration period, a 2-year general exploration period, and a 4-year detailed exploration period. To obtain an operation license, the holder must submit a detailed operating plan before the exploration license expires. To being extracting ore, an operating permit must be obtained. The permit is granted only after an Environmental Impact Assessment (EIA) is submitted and all necessary administrative and environmental permits as well as land-use approvals for the project area are issued. The term of an operating permit cannot exceed 10 years before it must be renewed, except for Group I(a) minerals, for which the maximum permit period is 5 years (Arseven and Ersin, 2015a, p. 3–5; Matthews and Incesulu, 2015, p. 166).

The Maden İşleri Genel Müdürlüğü (MIGEM) [General Directorate of Mining Affairs] of the T.C. Enerji ve Tabii Kaynaklar Bakanlığı (ETKB) [Ministry of Energy and Natural Resources] is the primary mineral regulatory agency. MIGEM sets general rules and policies for the mining sector and oversees mining operations. It is also responsible for issuing exploration and operating certificates and permits. The ETKB issues regulations concerning mineral exploration and extraction activities. It is also responsible for preparing and implementing national energy policies (Arseven and Ersin, 2015a, p. 1–2; Matthews and Incesulu, 2015, p. 165).

As of yearend 2014, there were 20,805 mineral licenses in effect in Turkey, of which 7,341 were exploration licenses and 13,464 were operating licenses. The total number of active licenses decreased from 23,366 licenses in 2013 owing largely to the decrease in the number of exploration licenses issued (9,984 as of December 2013). Of the total active mineral licenses, 9,359 had been issued for Group IV minerals, 5,398 for Group II(b) minerals, 4,781 for Group II(a) minerals, 879 for Group I(b) minerals, 70 for Group III minerals, 57 for Group I(a) minerals, and 37 for Group V minerals. Of the total exploration licenses, 5,021, or 73%, were for Group IV minerals, followed by 1,608 for Group II(b) minerals. Of the total 9,177 sites that had received operating permits, 5,862 were active in 2014 compared with 8,418 in 2013. Among those active operations in 2014, 1,957 were for Group II(a) minerals (33% of the total), 1,944 were for Group IV minerals (33%), 1,536 were for Group II(b) minerals (26%), 380 were for Group I(b) minerals (6%), 44 were for Group III minerals (0.7%), and only 1 was for Group V minerals. There were no producing operations for Group I(a) minerals (Maden İşleri Genel Müdürlüğü, 2015g).

A total of 3,181 new applications for mining licenses were filed in Turkey in 2014 compared with 5,577 applications in 2013. Of applications submitted during the same year, the Government granted 494 new licenses in 2014 compared with 981 in 2013 and 1,575 in 2012. The decrease in the number of new licenses granted during the year of filing since 2012 was attributed to delays in the licensing process caused by the additional layer of approval by the Office of the Prime Minister that was mandated by Circular 2012/15 of June 2012 as well as the decline in global mineral commodity prices. In 2014, MIGEM issued a total of 2,025 new licenses compared with 2,292 in 2013, including for applications submitted in previous years. Of the total issued in 2014, 1,258 were operating licenses and 767 were exploration licenses. Of the total operating licenses issued, 80 were for Group I(b) minerals, 490 were for Group II(a) minerals, 393 were for Group II(b) minerals, 7 were for Group III minerals, 293 were for Group IV minerals, and 2 were for Group V minerals and Group VI minerals. Of the total exploration licenses issued, 523 were for Group IV minerals, 218 were for Group II(b) minerals, 14 were for Group VI minerals, 10 were for Group V minerals, and 2 were for Group III minerals (Mining Turkey, 2014, p. 86; Maden İşleri Genel Müdürlüğü, 2015b, i).

Three Government institutions attached to the ETKB are involved in data collection and geologic surveying in the mineral sector. Maden Tetkik ve Arama Genel Müdürlüğü (MTA) [General Directorate of Mineral Research and Exploration] conducts geologic and geophysical surveys and mineralogical research to identify mineral deposits and produce reserve estimates and relevant maps of Turkey. Petrol İşleri Genel Müdürlüğü (PIGM) [General Directorate of Petroleum Affairs] collects information about petroleum exploration and production activity in the country. Türkiye Atom Enerjisi Kurumu (TAEK) [Turkish Atomic Energy Authority] is responsible for nuclear energy policy development and the coordination of scientific and technical activities in the nuclear sector. TAEK's programs are set by the Atom Enerjisi Komisyonu (AEK) [Atomic Energy Commission], which is composed of representatives from the TAEK, various ministries, and academia; the AEK oversees all nuclear activities and drafts and submits nuclear-related legislation and budgets to the Prime Minister (Maden Tetkik ve Arama Genel Müdürlüğü, 2015a; Petrol İşleri Genel Müdürlüğü, 2015; Türkiye Atom Enerjisi Kurumu, 2015a, b; World Nuclear Association, 2016).

Nuclear energy production in Turkey is governed by the Law on Construction and Operation of Nuclear Power Plants and Energy Sale (law No. 5710). Under the law, the TAEK is the competent authority for setting the criteria for building and operating nuclear powerplants and issuing licenses to nuclear powerplant operators, including site licenses, construction licenses, and operation licenses. The Draft Nuclear Law of 2014, however, would establish a Nuclear Regulatory Authority that would take over the nuclear licensing duties from the TAEK. As of yearend 2014, the draft law had not yet been introduced in the Parliament (Demirkan and Eryiğit, 2015, p. 173; Karaduman, 2015; World Nuclear Association, 2016).

Upstream activities for petroleum and natural gas are regulated by the PIGM under the Turkish Petroleum Law of 2013 (law No. 6491). Under Article 6 of the law, licenses and permits must be obtained from the PIGM to undertake hydrocarbon research and extraction and to operate hydrocarbon-related facilities in Turkey. Downstream activities for petroleum and natural gas are regulated by Enerji Piyasası Düzenleme Kurumu (EPDK) [Energy Market Regulatory Authority], an independent Government agency, under the Petroleum Market Law (law No. 5015) and the Natural Gas Market Law of 2001 (law No. 4646), as amended by law No. 5367 of 2005. The EPDK supervises and monitors all energy market activities. Under Article 3 of the Petroleum Market Law, the EPDK is responsible for issuing licenses for the following downstream petroleum activities: refining, distribution, storage, transmission, processing, and delivery, as well as independent user licenses and dealership licenses. Under Article 4 of the Natural Gas Market Law, the EPDK is responsible for issuing licenses for the following downstream natural gas activities: importing, exporting, transmission, storage, wholesale sale, distribution, and transportation. Upstream liquefied petroleum gas (LPG) activities are regulated by the Petroleum Law. Downstream LPG activities are regulated by the LPG Market Law of 2005 (law No. 5307), which requires a range of licenses (similar to those for petroleum) to be obtained from the EPDK to undertake LPG-related activities in Turkey (Arseven and Ersin, 2015b, p. 3).

Production

In 2014, significant increases in production were reported for illite (1,925%), other mica (514%), nepheline syenite (455%), talc (346%), olivine (92%), bentonite (75%), kaolin (74%), zeolites (49%), bauxite (37%), granite (36%), pumice (30%), silica (quartz) sand (29%), boron minerals (28%), phosphate rock (18%), calcite and travertine (14% each), basalt (12%), and fluorspar and soda ash (10% each). Production was also estimated to have increased for lead content of mined ore (48%), alumina (37%), aluminum (27%), and refined borates (12%). Significant decreases in production were reported for obsidian (88%), graphite (87%), asphalt (natural) and leonardite (48% each), feldspar (42%), diabase and onyx (32% each), hard coal (31%), diatomite (27%), chalcedony (25%), sodium sulfate (22%), lubricants (20%), perlite (17%), quartz and quartzite and pyrites (12% each), and emery, natural gas, and sepiolite and palygorskite (11% each). Production was also estimated to have decreased for antimony concentrates (Sb content), coke and semicoke, copper content of mined ore, iron content of mined ore, liquefied petroleum gas, and naphtha. No production was reported for aluminum sulfate, alunite, and sulfur. Zirconium production was reported again in 2014 after no production was reported in 2013 (table 1; Maden İşleri Genel Müdürlüğü, 2015a).

Structure of the Mineral Industry

Turkey's industrial minerals and metals production was undertaken mainly by privately owned companies, which also produced some coal, natural gas, and petroleum and all refined petroleum products. The Government's involvement in the mineral industry was focused on boron, coal, and hydrocarbon exploration and production. Although mining was one of the major sectors of the economy with active Government-owned enterprises, about 85% of mineral-producing facilities were estimated to be owned by the private sector. This was a complete reversal from before 2002 when Government-owned enterprises accounted for 85% of the mineral industry and was owing to ongoing privatization of enterprises in the mining and energy sectors and to other market liberalization measures undertaken by the Government (table 2; Matthews and Incesulu, 2015, p. 165; U.S. Department of State, 2015, p. 15).

Six Government-owned enterprises were engaged in mineral-related activities, as follows: Boru Hatları ile Petrol Taşıma A.Ş. (BOTAŞ) [Transportation of Petroleum by Pipelines Corp.] imported, transported, and sold natural gas and transported petroleum; Elektrik Üretim A.Ş. (EÜAŞ) [Electricity Generation Corp.] produced electricity primarily from coal; Eti Maden İşletmeleri Genel Müdürlüğü [General Directorate of Eti Mining Enterprises] had exclusive rights to explore for and develop boron deposits according to law No. 2840 of 1983; Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI) [General Directorate of Turkish Coal Enterprises] mined lignite and subbituminous coal; Türkiye Petrolleri Anonim Ortaklığı (TPAO) [Turkish Petroleum Co.] explored for, produced, and marketed crude petroleum; and Türkiye Taşkömürü Kurumu (TTK) [Turkish Hard Coal Enterprises] mined anthracite and bituminous coal (Boru Hatları ile Petrol Taşıma A.Ş., 2015b; Elektrik Üretim A.Ş., 2015; Eti Maden İşletmeleri Genel Müdürlüğü, 2015a, p. 20; Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü, 2015b; Türkiye Petrolleri Anonim Ortaklığı, 2015b; Türkiye Taşkömürü Kurumu, 2015a).

Mineral Trade

In 2014, Turkey's total exports of goods increased by 3.8% to $157.6 billion, whereas its total imports of goods decreased by 3.8% to $242.1 billion. As a result, the country's trade deficit amounted to $84.6 billion in 2014 compared with $99.9 billion in 2013, and the proportion of exports to imports increased to 65.1% from 60.3% in 2013 (Türkiye Istatistik Kurumu, 2015c).

Turkey's exports of iron and steel were valued at $10.8 billion in 2014 compared with $11.6 billion in 2013. Exports of fabricated metal products in 2014 were valued at about $6.7 billion compared with $6.2 billion in 2013; petroleum and petroleum products, $5.6 billion compared with $6.2 billion in 2013; industrial minerals, including cement, ceramics, glass, lime, and stone, about $4.0 billion compared with $3.9 billion in 2013; nonferrous metals, about $2.7 billion compared with $2.6 billion in 2013; fertilizers, $1.9 billion compared with $2.0 billion in 2013; and natural gas, $409 million compared with $516 million in 2013 (T.C. Kalkınma Bakanlığı, 2015a).

Turkey's imports of petroleum and petroleum products were valued at $16.1 billion in 2014, which remained about the same as in 2013. Imports of iron and steel, which consisted primarily of scrap steel, were valued at $11.3 billion compared with $12.2 billion in 2013; nonferrous metals, $7.9 billion compared with $7.7 billion in 2013; fabricated metal products, $3.9 billion compared with $3.8 billion in 2013; natural gas, $2.7 billion, which remained about the same as in 2013; industrial minerals, $2.0 billion compared with $1.8 billion in 2013; and fertilizers, $1.5 billion, which remained about the same as in 2013 (T.C. Kalkınma Bakanlığı, 2015b).

In 2014, the value of Turkey's exports of mined minerals decreased by 7.7% to $4.65 billion. Turkey's total exports, by tonnage, amounted to 21.2 Mt compared with 22.3 Mt in 2013. Mineral exports accounted for 2.9% of the country's exports, by value, in 2014 compared with 3.3% in 2013. Exports of natural stones (of which marble was the largest component) amounted to 7.3 Mt and accounted for 45.8% of Turkey's mineral exports, by tonnage; metals, 4.5 Mt (30.0%); and industrial minerals, 143,000 t (18.3%). The leading mineral exports in 2014 by both tonnage and value were marble block and travertine, which amounted to 4.92 Mt valued at $977.8 million, and processed marble, 1.54 Mt valued at $799.3 million. These were followed by copper ore, which amounted to 342,300 t valued at $370 million (and accounted for 8% of the total mineral exports); chromite ore, 1.41 Mt valued at $342 million (7%); borates and concentrate, 841,000 t valued at $266 million (6%); zinc ore, 420,300 t valued at $236 million (5%); feldspar, 4.6 Mt valued at $157 million (3%); ferrochromium, 102,300 t valued at $151 million (3%); magnesite, 303,900 t valued at $101 million (2%); gypsum, 847,6000 t valued at $71 million (1%); quartz, 465,900 t valued at $63 million (1%); and bentonite, 373,600 t valued at $48 million (1%) (İstanbul Maden ve Metaller İhracatçıları Birlikleri, 2015a; Maden İşleri Genel Müdürlüğü, 2015c, e, f, h).

China continued to be the leading recipient of Turkey's mined mineral exports, accounting for 39.0% of the total in 2014; it was followed by the United States (9.2%), Belgium (3.1%), Italy (2.9%), Iraq (2.8%), Saudi Arabia (2.6%), and India (2.3%). Mined mineral exports to East Asia decreased by 20.8%, whereas exports to the EU increased by 10.9%; and those to North America, by 9.9% in 2014 (İstanbul Maden ve Metaller İhracatçıları Birlikleri, 2015b, p. 2–3).

Turkey's exports of goods to the United States amounted to $7.4 billion in 2014 compared with $6.7 billion in 2013. Exports of semifinished iron and steel products, such as bars and rods, ingots, and rolled steel, were valued at $1.0 billion. Exports of material categorized under the label stone, sand, cement, and lime were valued at $361 million. Exports of iron and steel products, such as pipes and wire, were valued at $121 million. Exports of metals were also relatively small, with exports of bauxite and aluminum valued at $12.9 million, and those of nickel, $2.0 million (U.S. Census Bureau, 2015b).

Turkey's imports of goods from the United States amounted to $11.6 billion in 2014 compared with $12.0 billion in 2013. More than 30% of goods exported to Turkey from the United States were related to the mineral industry. Imports of steelmaking products, which consisted mostly of steel scrap, were valued at $1.3 billion. In 2014, imports of steel scrap from the United States increased by 48.8% to 3.7 Mt, whereas imports from the EU decreased by 4.6% to 10.2 Mt. Imports of fuel oil were valued at about $679 million; metallurgical-grade coal, about $403 million; other petroleum products, $249 million; finished metal shapes, $91 million; other coal and fuels, $69 million; nonmonetary gold, $62 million; aluminum and alumina, $21 million; and iron and steel mill products, $17 million (Türkiye Çelik Üreticileri Derneği, 2015a; U.S. Census Bureau, 2015a).

The leading mineral commodity exporters of Turkey were among the country's largest exporters overall in terms of the value of exports. Eti Maden, the leading mineral exporter of the country, ranked 14th among all exporters, with $266 million in mineral exports and $839 million in total exports. Çayeli Bakır İşletmeleri A.Ş., a copper producing subsidiary of First Quantum Minerals Ltd. of Canada, ranked second among mineral exporters and 57th among all exporters with $219 million in exports. Eti Krom A.Ş., a ferrochromium producing subsidiary of Yıldırım Group of Turkey, ranked third in mineral exports and 83d overall with $159 million exports. These companies were followed by Tuprag Metal Madencilik Sanayi ve Ticaret A.Ş., a gold-producing subsidiary of Eldorado Gold Corp. of Canada, with $135 million in exports; Ekin Maden Ticaret ve Sanayi A.Ş., a chromium, copper, lead, and zinc producer, with $103 million in exports; and Kuzey Ege Bakır İşletmeleri AŞ, a copper- and molybdenum-producing subsidiary of Özdoğu İnşaat ve Tic. Ltd. Şti., with $72 million in exports (Türkiye İhracatçılar Meclisi, 2015).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Eti Alüminyum A.Ş., which was a 100%-owned subsidiary of Cengiz Holding A.Ş., remained the only primary aluminum producer in Turkey. The company continued its multiyear modernization of the Seydisehir aluminum smelter in Konya Province in central Anatolia. The fully integrated smelter was supplied by seven bauxite mines located within 25 kilometers (km) of the smelter and produced about 53,500 t of aluminum in 2014. It was estimated to supply 15% of Turkey's annual aluminum consumption; imported aluminum supplied the remaining 85%. Eti Alüminyum was in the process of converting the smelter from Soderberg to prebaked anode technology by installing a green anode plant and rodding shop technology. The reconstructed smelter was scheduled to be commissioned at the end of 2014. The ongoing modernization of the Seydisehir plant was projected to increase capacity to 95,000 metric tons per year (t/yr) by 2016 from 70,000 t/yr (Anatolia News Agency, 2011; Daynes, 2013; Outotec Oyj, 2013; Eti Alüminyum A.Ş., 2014).

Şahinler Metal Sanayi ve Ticaret A.Ş. was the leading producer of secondary aluminum from scrap and other recycled metals in Turkey and among the top 500 industrial producers in the country. It had the capacity to produce of 92,000 t/yr (combined) of aluminum ingot, deoxidant, and billet (Şahinler Metal Sanayi ve Ticaret A.Ş., 2015).

Demireller Tarim Madencilik Petrol Sanayi ve Ticaret Limited Şti. was Turkey's leading producer of nonmetallurgical bauxite and calcium aluminate cement with a production capacity of 500,000 t/yr. The company produced bauxite from 10 licensed areas with total probable reserves of 10 Mt in Mersin Province. It planned to expand its bauxite production capacity to 750,000 t/yr in coming years (Industrial Minerals, 2010, 2014, 2016; Demireller Tarim Madencilik Petrol Sanayi ve Ticaret Limited Şti., 2013).

Antimony.—Eti Bakır A.Ş., which was a 100%-owned subsidiary of Cengiz Holding A.Ş., remained the leading antimony producer in Turkey. The company's Halikoy ore enrichment (flotation) plant had the capacity to produce 0.26 metric tons per day (t/d) of antimony concentrate at a grade of 69% antimony. Eti Bakır operated an underground mine in the village of Emirli with a production capacity of 65 t/d of antimony ore (Cengiz Holding A.Ş., 2014; Eti Bakır A.Ş., 2014b).

Üç Yıldız Antimon Madencilik Ithalat ve Ihracat Sanayi ve Ticaret A.Ş., which was a subsidiary of Tri-Star Resources plc of the United Kingdom, held a Group IV exploitation concession covering nonferrous metals at the Goynuk antimony prospect on the Murat Dagi belt located 50 km north of the city of Usak in western Turkey. The company's property covered 25 hectares within an exploration area of 1,480 hectares. According to a technical report commissioned by Tri-Star Resources in 2012, the average grade of the estimated 80,000 t of rock in the Goynuk Mine dumps was estimated to be between 2.13% and 2.36% antimony. The Goynuk deposit remained undeveloped in 2014 (Juhas, 2013, p. 15, 73; Tri-Star Resources plc, 2015, p. 8).

Chromium and Ferrochromium.—Eti Krom A.Ş. remained Turkey's leading chromite ore and sole ferrochromium producer in 2014. The company was also the country's leading exporter of chromite ore. Eti Krom operated 79 mines across the country, with a total annual production capacity of 1 Mt of chromium. Most of these mines were underground mines located in Elazig Province; the other mines were located in Adana, Diyarbakir, Hatay, Kayseri, and Malatya. The company's total proven reserves were about 100 Mt and probable reserves were about 150 Mt at a grade of 48% chromium (Mining Turkey, 2013, p. 48; Eti Krom A.Ş., 2014a, b).

Eti Krom operated two ferrochromium plants in Elazig Province, which together had four furnaces with a combined production capacity of 150,000 t/yr, but the plants produced only about 61,000 t of ferrochromium in 2014. Plant B accounted for 100,000 t/yr of capacity and Plant A, 50,000 t/yr. The two plants also had a slag-recycling operation with a total recovery capacity of 10,000 t/yr. They used slag containing 6% to 8% chromium to produce ferrochromium (Eti Krom A.Ş., 2014b, c).

Cobalt and Nickel.—Meta Nikel Kobalt A.Ş. (META), which was jointly owned by Meta Mining Co. and the Zorlu Group, began test production at its nickel- and cobalt-processing plant in Gordes in Manisa Province in the 4th quarter of 2014. This was the first hydrometallurgy processing plant in Turkey. In the first phase of the project, which required an investment of $360 million and was to be fully activated in 2015, 1.5 million metric tons per year (Mt/yr) of lateritic ore would be processed to obtain a mixed nickel-cobalt hydroxide product containing 10,000 t of nickel and 750 t of cobalt. In the second phase of the project (up through 2018), which would involve an additional investment of $340 million, the production capacity of the nickel-cobalt refinery would be doubled to 3 Mt/yr of lateritic ore. The company planned to double production of nickel to 20,000 t/yr by 2018 (Mining Turkey, 2014, p. 21; Zorlu Group, 2015).

Çaldağ Nikel Madencilik San. ve Tic. A.Ş. submitted a new EIA for its nickel and cobalt project at the Caldag Mine in Manisa Province in January. The company planned to process a total of 29.7 Mt/yr of ore at at three open facilities during 15 years of operation. It would process 250,000 t/yr of ore to produce 2,500 t/yr of nickel and 150 t/yr of cobalt in the first 5 years of operation. Once full capacity was reached, Çaldağ planned to process 1.5 Mt/yr of ore to produce 15,000 t/yr of nickel and 900 t/yr of cobalt. The ore body at Caldag was estimated to contain 1.16% nickel and 0.07% cobalt, as well as 21.6% iron. In November, the EIA was approved by the Ministry of Environment and Urban Planning, but construction had not yet begun as of yearend 2014 (Enerji Ajansı, 2014; T.C. Çevre ve Şehircilik Bakanlığı, 2014, p. 31, 58, 63; Çaldağ Nikel Madencilik San. ve Tic. A.Ş., 2015).

Copper, Molybdenum, and Zinc.—Eti Bakır remained the leading copper-ore-producing company in Turkey. Other notable copper ore producers included Çayeli Bakır İşletmeleri A.Ş. and Park Elektrik Üretim Madencilik San. ve Tic. A.Ş., which was majority owned by Park Holding A.Ş. (61.24%) (Eti Bakır A.Ş., 2014a; Çayeli Bakır İşletmeleri A.Ş., 2015; Park Elektrik Üretim Madencilik San. ve Tic. A.Ş., 2015b, c).

Eti Bakır produced about 130,000 t/yr of copper concentrate grading 22% copper from 3.5 Mt of crude ore at its Murgul facility located in Artvin Province and about 110,000 t/yr of copper concentrate and 400,000 t/yr of pyrite concentrate from 1.1 Mt of crude ore at the Kure facility in Kastamonu Province. The company also produced 42,000 t/yr of electrolytic copper and 200,000 t/yr of sulfuric acid at its smelter and electrolysis plant in Samsun Province (Eti Bakır A.Ş., 2014c, e, f).

Park Elektrik operated the Siirt Madenkoy copper mine in Siirt Province, which was the largest open pit mine in Turkey in terms of resources. The mine had a resource of 41.5 Mt consisting of 36.3 Mt of measured resources at a grade of 1.95% copper, 5.0 Mt of indicated resources at a grade of 2.45%, and 225,000 t of inferred resources at a grade of 3.52%. The average grade was reported to be 2.02% in 2014. As of yearend 2014, 8 Mt of ore had been extracted. Park Eletrik produced 1.7 Mt of ore and processed 1.6 Mt of total output at its 1.8-Mt/yr concentration facility. Copper concentrate production in Madenkoy decreased by 9% to 91,185 t in 2014 from 96,038 t in 2013; however, this level was higher than the 89,253 t produced in 2012. Sales decreased by 9% to 85,038 t in 2014 (Park Elektrik Üretim Madencilik San. ve Tic. A.Ş., 2015a, p. 15–16).

Çayeli Bakır İşletmeleri produced about 29,000 t of copper and 37,000 t of zinc at its Cayeli copper mine located in Rize Province in 2014 compared with 31,510 t of copper and 43,097 t of zinc in 2013. Both the mine and plant achieved production records in the 4th quarter of 2014. Total mineral reserves of the Cayeli Mine stood at 7.1 Mt at 3.06% copper, 3.64% zinc, and 0.39 gram per metric ton (g/t) gold as of yearend 2012. Proven reserves were 4.5 Mt at grades of 3.02% copper, 3.19% zinc, and 0.36 g/t gold, whereas probable reserves were 2.6 Mt at grades of 3.12% copper, 4.42% zinc, and 0.43 g/t gold (First Quantum Minerals Ltd., 2015, p. 14; 2016a, b).

Columbus Copper Corp. of Canada received an operating permit for its Karapinar copper porphyry license in Kayseri Province in July. The company reported that its drilling intersected mineralization of 0.48% copper and 0.10 g/t gold at a depth of 91.3 meters (m), and a 49.35-m-long zone with a mineralization of 0.47% copper and 0.12 g/t gold at a depth of 408 m in one hole and 0.93% copper and 0.10 g/t gold at a depth of 79.6 m in another hole. Columbus Copper was in negotiations with First Quantum to purchase the latter's 20% interest in Karapinar in exchange for Columbus Copper's assets in Serbia (Columbus Copper Corp., 2014).

Özdoğu İnşaat ve Ticaret Ltd. Şirketi held an operating license for Turkey's sole molybdenum producer, which was located in Tepeoba in Balikesir Province, and which also produced copper. The company produced 50,000 t of copper concentrate and 1,800 t of molybdenum concentrate annually. It estimated the Tepeoba Mine's reserves to be 23.5 Mt grading 0.32% copper and 0.04% molybdenum (revised from the 17.5 Mt that had previously been reported by the MTA). Özdoğu planned to operate the mine for 12 years following a 1-year preparation stage and to process 2.5 Mt/yr of ore owing to its relatively low grade. At a processing rate of 350 metric tons per hour, the Tepeoba facility would produce copper concentrate at grades of 29% to 31% copper and molybdenum concentrate at grades of 50% to 55% molybdenum. Özdoğu doubled its metallurgic recovery capacity through technological upgrades in 2012 (Maden Ocak Teknolojileri, 2014, p. 12–13; Metso Corp., 2015).

Gold and Silver.—Turkey remained Europe's leading gold producer, but production decreased by 7.5% to 31 t in 2014. Gold imports decreased by 57% to 131 t in 2014 compared with imports in 2013, although this was still more than the 120 t of gold imported in 2012. According to the Turkish Gold Miners Association, reserves in Turkish gold deposits contained 800 t of gold and resources (exclusive of reserves) contained an additional 5,700 t of gold. Among gold deposits, Kisladag and Copler were the most significant, with reserves containing 530 t (17 million troy ounces) and 310 t (10 million troy ounces) of gold, respectively (Turkish Gold Miners Association, 2015c–e).

Sixteen international companies were engaged in either exploration or extraction activities in Turkey in 2014, including 10 companies from Canada (Alamos Gold Inc., Aldridge Minerals Inc., Centerra Gold Inc., Columbus Copper Corp., Eldorado Gold Corp., Eurasian Minerals Inc., Frontline Gold Corp., Mediterranean Resources Ltd., Pilot Gold Inc., and Teck Resources Ltd.), 3 from Australia (Chesser Resources Ltd., Global Resources Corp., and Impact Minerals Ltd.), 2 from the United Kingdom (Ariana Resources plc. and Stratex International plc.), and 1 from the United States (Alacer Gold Corp.). Koza Altın İşletmeleri A.Ş. and Gümüştaş Madencilik ve Ticaret A.Ş. were the only two domestically owned gold producers in the country (Gümüştaş Madencilik ve Ticaret A.Ş., 2015; Turkish Gold Miners Association, 2015b).

In 2014, the following eight gold mines were in operation in Turkey: Efemcukuru and Kisladag, which were operated by Eldorado; Copler, by Alacer; Himmetdede, Kaymaz, Mastra, and Ovacik, by Koza Altın; and Bolkar, by Gümüştaş Madencilik. The Kisladag open pit gold porphyry mine in Usak Province, which became the first heap-leach gold mine in Turkey when it began operating in 2006, remained the largest gold mine in the country in terms of output. In 2014, total gold production at Eldorado's Kisladag and Efemcukuru Mines were 9.7 t (311,233 troy ounces) and 3.1 t (98,829 troy ounces), respectively. The Copler open pit mine continued to be the second largest gold mine. In 2014, gold production at Alacer's Copler Mine decreased by 16% to 7.1 t (227,927 troy ounces) (Turkish Gold Miners Association, 2015a; Alacer Gold Corp., 2016; Eldorado Gold Corp., 2016a, b).

Koza Altın produced 9.8 t (316,510 troy ounces) of gold (from ore grading 5.73 g/t) and 4.4 t (142,000 troy ounces) of silver (from ore grading 4.27 g/t) in 2014 compared with 10.9 t (350,000 troy ounces) of gold (from ore grading 5.27 g/t) and 5.6 t (179,000 troy ounces) of silver (from ore grading 4.72 g/t) in 2013. The company held 57 operating licenses and 281 exploration licenses across the country as of yearend 2014. Koza Altın began operating its fourth mine, the Himmetdede Mine, in November 2013. It completed the construction of a crushing circuit in the 2d quarter of 2014. The processing plant in Himmetdede was scheduled to begin operating in January 2015. The Mollakara project in the Agri Province was at the feasibility stage (Koza Altın İşletmeleri A.Ş., 2015, p. 3–4).

In April, Ariana Resources renewed its mining license for the Kiziltepe sector of the Red Rabbit project for 10 years; the project was jointly owned with Proccea Construction Co. of Turkey. In May, the company defined high-grade drilling targets in Kiziltepe. In September, it acquired 100% surface land rights at the Arzu South section of Kiziltepe. In November, Ariana Resources confirmed the presence of porphyry deposits in Kiziltepe. In December, the company defined gold targets at the Kepez West section of the project. It also continued to work with Eldorado on the Salinbas zone of the Artvin project in Artvin Province. The scoping study on the project was nearly completed and was expected to show resources of about 1 million troy ounces (Ariana Resources plc, 2015, p. 8, 10).

Iron and Steel.—Turkey's production of crude steel decreased further by 1.8% to 34.0 Mt in 2014 after decreasing by 3.4% in 2013. This was in contrast to rapid growth from 2007 to 2012 when Turkey's steel output had increased at the third fastest rate globally after those of China and India. Output in 2014 was below the level of 2011, although it was 32% higher than the pre-global-recession level in 2007. Seventy percent of steel was produced from steel scrap in electric arc furnaces (EAFs). Crude steel production in EAF mills decreased by 3.9%, whereas production in basic oxygen furnace mills increased by 3.5%. Turkey's annual crude steel production capacity increased by 1.9% to 50.2 Mt in 2014. EAF mills accounted for 77% of the country's total steel capacity. The steel sector's capacity utilization rate decreased to 68% in 2014 from 70% in 2013 (Türkiye Çelik Üreticileri Derneği, 2015b).

Billet accounted for 72% of total crude steel production in Turkey in 2014. Billet production decreased by 6.4% to 24.6 Mt, whereas slab production increased by 12.7% to 9.4 Mt. Slab output in 2014 nonetheless remained below its level in 2011. The capacity utilization rate of slab producers increased to 55% in 2014 from 52% in 2013. Finished steel production continued to exceed crude steel production in Turkey after exceeding it for the first time in 2013. Finished steel output decreased by 0.9% to 36.1 Mt in 2014. Long steel accounted for 71.3% of total finished steel production, and flat steel made up the remaining 28.7%. Finished long steel production decreased by 3.1% to 25.7 Mt, whereas flat steel production increased by 5.1% to 10.4 Mt (Çelik İhracatçıları Birliği, 2015; Türkiye Çelik Üreticileri Derneği, 2015b).

Turkey remained Europe's second-ranked and the world's eighth-ranked exporter of iron and steel. In terms of tonnage, total iron and steel exports, which included articles of steel and steel pipes, decreased by 5.0% to 18.0 Mt in 2014; in terms of value, they decreased by 3.5% to $15.2 billion. Long steel products accounted for 61% of the country's total steel exports; flat steel, 14%; tube and pipe products, 10%; and semifinished steel products, 3%. Exports of long steel decreased by 2.5% to 11.0 Mt, and that of billet, by 69% to 335,000 t, whereas exports of flat steel increased by 6.4% to 2.5 Mt. Countries in the Middle East and North Africa (MENA) region accounted for 35% of exports, followed by the European Union (16%) and North America (15%). Turkey's total iron and steel imports decreased in 2014, but they stayed at a relatively high level after having increased by 25.4% in 2013. Total steel imports decreased in terms of tonnage by 7.1% to 13.8 Mt in 2014; their value decreased by 6.1% to $12.0 billion. Imports of flat steel decreased by 5.4% to 6.7 Mt, and that of semifinished steel, by 12% to 4.78 Mt. Turkey also imported about 3.0 Mt of billet and bloom, 1.8 Mt of slab, and 1.5 Mt of long steel products, although the country's long steel capacity was double its consumption. Turkey remained the leading importer of scrap in the world. The country's imports of scrap decreased in value by 4.8% to $7.2 billion and in weight by 3.3% to 19.1 Mt in 2014 owing to decreased domestic steel production by the EAF mills (Türkiye Çelik Üreticileri Derneği, 2015a, b).

There were a total of 31 iron and steel facilities in the country in 2014, 10 of which were located in the Mediterranean region; 9, in the Marmara region; 7, in the Aegean region; 3, in the Black Sea region; and 2, in the central Anatolia region. The production capacities of 12 facilities exceeded 2 Mt; 7 had capacities of between 1 and 2 Mt/yr, 6 had capacities between 500,000 t/yr and 1 Mt/yr, and 6 had capacities between 50,000 t/yr and 500,000 t/yr. The Erdemir Group, which continued to be Turkey's leading iron and steel producer, produced 2.66 Mt of beneficiated iron ore and pellets in 2014, which was a slight increase from the 2.65 Mt produced in 2013. The company's pellet production increased to 1.55 Mt in 2014 from 1.48 Mt in 2013, whereas other products output, including lump ore, fine ore, byproducts, and pellet cake, decreased to 1.11 Mt in 2014 from 1.17 Mt in 2013. Erdemir accounted for 25% of all crude steel produced in Turkey. The company produced about 7.0 Mt of flat-finished steel products in 2014 compared with 6.4 Mt in 2013, and 1.2 Mt of long-steel products in 2014 compared with 1.4 Mt in 2013. Of total flat-finished steel products, Erdemir Madencilik Sanayi ve Ticaret A.Ş. (Erdemir), which was a subsidiary of the Erdemir Group located in Eregli, Zonguldak Province, provided about 45% of the group's hot-rolled flat steel and 100% of its cold-rolled flat steel. İskenderun Demir ve Çelik A.Ş. (Isdemir), which was the Erdemir Group's other subsidiary located in Iskenderun, Hatay Province, provided 55% of the group's hot-rolled flat steel. Erdemir produced 2.4 Mt of hot-rolled steel and 1.7 Mt of cold-rolled steel, whereas İsdemir produced 2.9 Mt of hot-rolled steel. Erdemir's capacity utilization rate was 91.2%, whereas Isdemir's was 81.6%; as a whole, the Erdemir Group operated at a capacity utilization rate of 86.3% (Ereğli Demir ve Çelik Fabrikalari T.A.Ş., 2015a, p. 31–33; 2015b, p. 12; Türkiye Çelik Üreticileri Derneği, 2015c).

Turkey has about 900 iron ore deposits located across the country, but only about 30 of them were either exploitable or being exploited. Chief among the latter were the A-B Kafa and Ekinbasi deposits, which accounted for 42% of reserves, the Deveci deposit (34%), the Karacat and Mentes deposits (7%), the Koruyeri deposit (4%), and the Karakuz deposit (3%). Turkey's iron ore reserves are mostly low grade, with 30% to 35% Fe content. Owing to the relatively low grade of its ore and domestic iron ore production not meeting domestic demand, the Turkish steel industry was about 50% dependent on ore imports (Mining Turkey, 2012, p. 19; Steel Orbis, 2012).

Özkoyuncu Madencilik A.Ş. was a leading iron ore producer in Turkey with about 2 Mt in annual output. The company operated 10 mines in Yahyali, Kayseri Province, which reportedly contained the country's largest and highest grade iron ore deposits. Özkoyuncu planned to begin extracting from two new underground mines in the near future. Hekimhan Madencilik İthalat İhracat Sanayi ve Ticaret Ltd. Şti. operated the Deveci iron mine in Malatya Province, which was the largest manganiferous iron ore deposit in Turkey with more than 50 Mt of iron ore reserves. The company extracted siderite ore from Deveci through open pit mining. Hekimhan Madencilik's estimated sales of ore were about 1 Mt in 2014. The company planned to complete the building of a calcination plant and to operate the mine at its full capacity of 2 Mt/yr beginning in 2015 (Hekimhan Madencilik İthalat İhracat Sanayi ve Ticaret Ltd. Şti, 2015; Özkoyuncu Madencilik A.Ş., 2015a, b).

Industrial Minerals

Boron.—Eti Maden İşletmeleri Genel Müdürlüğü continued to be the leading producer and exporter of boron in the world with a 47% global share in 2014. The company's refined boron production increased by 12% to about 2.0 Mt in 2014. Eti Maden planned to increase its share of the global market to 65% by 2019. The company mined borax, colemanite, kernite, and ulexite from deposits located in Bigadic, Canakkale Province; Emet in Kutahya Province; Kestelek in Bursa Province; and Kirka in Eskisehir Province, and it produced 16 types of boron products, including borax decahydrate, boric acid, boron oxide, concentrated colemanite, ground colemanite, calcined tincal, and ulexite. In 2014, exports to more than 100 countries made up 97% of total sales and increased in value by 9% to $871 million. Countries in Asia received 60% of Turkey's exports of boron products, followed by Europe (23.7%) and North America (17.5%). The remaining 3% of output, or 70,000 t, was sufficient to meet domestic demand for boron products, 50% of which were consumed by the glass and ceramics industries. Boron chemicals accounted for 95% of total sales, whereas boron concentrate made up only 5%, which was in line with Eti Maden's production focus on higher-value-added boron chemical products (Eti Maden İşletmeleri Genel Müdürlüğü, 2013, p. 11; 2015a, p. 3–4, 20, 22, 26; 2015b; 2015c, p. 7, 27).

Eti Maden's total boron chemical plant capacity increased to 2.19 Mt/yr in 2014 from 2.13 Mt/yr in 2013. The company planned to expand its total boron production capacity to 4.8 Mt/yr by 2019. The plant's capacity utilization rate was 91% in 2014. According to the company, total boron reserves amounted to 3.3 Gt as of yearend 2014. Boron reserves were 1.8 Gt of colemanite and ulexite in Emet, 832.7 Mt of tincal in Kirka, 631.8 Mt of colemanite and ulexite in Bigadic, and 5.3 Mt in Kestelek. Most of Eti Maden's boron chemical production took place in the 840,000-t/yr-capacity borax pentahydrate facility in Kirka, followed by the 290,000-t/yr-capacity boric acid complex in Emet, and the 115,000-t/yr-capacity borax pentahydrate facility in Bandirma. In 2014, Eti Maden began operating a new 50,000-t/yr-capacity boric acid plant at its Emet complex (Eti Maden İşletmeleri Genel Müdürlüğü, 2015a, p. 20, 26, 27; 2015c, p. 27).

Cement.—Turkey's production of cement remained at about 71.3 Mt in 2014. Cement plants in the Marmara, Mediterranean, and Central Anatolian regions provided most of the production, accounting for 24.2%, 22.7%, and 14.8% of total output, respectively. Domestic sales of cement accounted for about 89% of total output and increased by 1.5% to 63.2 Mt in 2014. The Marmara region accounted for 28.2% of domestic production, followed by the Mediterranean region (20.2%), and the Central Anatolia region (17.2%), although production in the Black Sea region showed the highest increase with 7.5%. Turkey's production of clinker increased by 1.9% to 62.5 Mt in 2014. Domestic sales of clinker accounted for about 95% of total output and amounted to 59.7 Mt. Clinker sales increased by 188.3% in the Black Sea region to 242,130 t (Türkiye Çimento Müstahsilleri Birliği, 2015a).

Turkey's exports of cement accounted for about 11% of total output in 2014 and decreased by 21% to 7.65 Mt from 9.63 Mt in 2013. Libya received 25% of Turkey's total cement exports, followed by Syria (14%), Iraq (10%), Israel (9%), and Russia (8%). Turkey's exports of clinker, which accounted for only 5% of total output, increased by 31% to 2.86 Mt in 2014 from 2.18 Mt in 2013. Egypt received 22% of Turkey's total clinker exports, followed by Ghana (13%), Brazil (10%), and Mauritania (8%). Turkey imported 103,115 t of clinker in 2014, all of which was supplied by Greece to importers located in the Marmara region (Türkiye Çimento Müstahsilleri Birliği, 2014a; 2015a, b).

In 2014, 49 integrated cement plants and 20 grinding facilities were in operation in Turkey. The Turkish cement sector continued to add new capacity—the sector's total cement production capacity reached 113.5 Mt, and its total clinker production capacity increased to 69.6 Mt as of yearend 2014 compared with 107.4 Mt and 68.5 Mt, respectively, as of yearend 2013. Capacity utilization by cement producers decreased to 63.9% in 2014 from 68.6% in 2013, whereas capacity utilization by clinker producers increased to 92.2% in 2014 from 91.7% in 2013 (Türkiye Çimento Müstahsilleri Birliği, 2014b, 2015c; International Cement Review, 2015, p. 353).

Domestically owned companies made up about 77% of Turkey's total capacity, and companies with some multinational ownership accounted for the remaining 23%. No individual company held a dominant position in the country's cement market. Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu was the leading cement producer and operated 10 cement plants that had a total (combined) annual capacity of 21.6 Mt. Adana Çimento Sanayii ve Ticaret A.Ş., which produced both gray and white cement, was OYAK's largest (in terms of output) cement subsidiary; it had the capacity to produce 5.5 Mt/yr of gray cement and 2.3 Mt/yr of clinker. In 2014, OYAK acquired Denizli Çimento, which had the capacity to produce 3.0 Mt of cement and 1.8 Mt of clinker, from CRH plc. and Eren Holdings A.Ş. The second-ranked cement producer in Turkey, Limak Şirketler Grubu, operated seven cement plants and three grinding units with a total (combined) capacity of 12.76 Mt/yr. In 2014, Limak was in the process of expanding the clinker production capacity of its plant in Balikesir Province to 900,000 t/yr from 430,000 t/yr. It also commissioned a new 3,500 t/d line at its Trakya plant. Akçansa Çimento Sanayi ve Ticaret A.Ş., which was jointly owned by HeidelbergCement AG of Germany (40%) and Sabancı Holding A.Ş. (40%), was the third-ranked cement producer in Turkey. The company operated three cement plants and one grinding plant, and had a total production capacity of 9.2 Mt/yr (International Cement Review, 2015, p. 353–354; Limak Holding, 2015; Ordu Yardımlaşma Kurumu Çimento Grubu, 2015).

Feldspar.—Kaltun Madencilik Sanayi ve Ticaret A.Ş. was a leading feldspar producer in Turkey and had the capacity to produce 2 Mt/yr of feldspar, 150,000 t/yr of quartz, and 500 t/yr of mica from its mines, which were located in Cine, Milas, and Yatagan (all in Mugla Province). The company exported about 80% of its output. In 2014, Kaltun's total sales amounted to 1.5 Mt, of which 1.3 Mt was exports. The company accounted for about 40% of Turkey's feldspar production and 35% of its feldspar exports. Its biggest export markets were Italy and Spain, where it also operated milling and blending facilities. Kaltun also owned feldspar deposits in Egypt. The company aimed to increase its annual sales to 2 Mt in 2015 (Industrial Minerals, 2015b).

Magnesium and Magnesite.—Turkey produced all three major types of magnesia, including caustic calcined magnesia (CCM), dead-burned magnesia (DBM), and fused magnesia (FM). The refractories industry continued to be the largest end market for the country's magnesia production. Refractories for steel were the largest industrial consumer of magnesia, followed by cement and glass producers (Industrial Minerals, 2016).

Kümaş Kütahya Manyezit Sanayi A.Ş. was the country's leading DBM producer with a production capacity of 300,000 t/yr. The company operated magnesite mines in Bilecik, Eskisehir, and Kutahya Provinces and had total reserves of about 127 Mt. In May, Kümaş constructed two new furnaces with a combined production capacity of 18,000 t/yr in its Kutahya FM plant, which increased the plant's total FM capacity to 40,000 t/yr. Akdeniz Mineral Kaynakları A.Ş., a subsidiary of Grecian Magnesite S.A. of Greece, was the country's second-ranked producer of magnesite. Its output consisted of a variety of CCM products. The company's deposits were located within three concessions totaling 42.4 square kilometers in Eskisehir Province. In October 2013, Akdeniz installed a new rotary kiln with a production capacity of 50,000 t/d of CCM, which doubled its annual CCM production capacity to 32,000 t/yr. About 75% of annual production was exported. Konya Selçuklu Krom Magnezit Tuğla Sanayi A.Ş. held deposits in Konya Province that were estimated to have about 9 Mt of proven and 40 Mt of probable magnesite reserves. The company operated a rotary kiln with the capacity to produce 40,000 t/yr of CCM. Magnesit Anonim Şirketi (MAŞ), which was a subsidiary of RHI Group of Austria, produced refractories and DBM in five kilns at its Dutlucu plant in Eskisehir Province by processing about 530,000 t/yr of magnesite extracted from its own mines in Eskisehir as well as magnesite obtained from other producers. MAŞ's had the capacity to produce 265,000 t/yr of DBM. The company intended to buy magnesite mining rights and a 60,000-t/yr-capactiy DBM plant in Erzurum Province from Cihan Grubu; however, in September 2014, MAŞ announced that it would no longer pursue the deal owing to a contractual dispute (Grecian Magnesite S.A., 2013; Magnesit Anonim Şirketi, 2015; Industrial Minerals, 2016).

Perlite.—Bergama Mining Construction Machinery Perlite Industry & Trade Inc. was one of the leading producers of perlite in Turkey and had the capacity to produce about 120,000 t/yr of crushed and screened perlite ore in Bergama, Izmir Province. The company operated 10 perlite quarries using open pit mining within a licensed area of 5,752 hectares in Ankara, Canakkale, Izmir, and Manisa Provinces. Bergama Mining planned to build two new plants in the near future. The proposed Aliaga plant in Izmir Province would be located close to three perlite quarries and to Aliaga Port on the Aegean Sea coast. The proposed Akhisar plant in Manisa Province would produce perlite-based building materials (Bergama Mining Construction Machinery Perlite Industry & Trade Inc., 2015a–c).

Phosphate Rock.—Phosphate rock production started in Turkey in 2013 and continued in 2014. Eti Bakır operated the 550,000-t/yr-capacity Mazidagi phosphate fertilizer plant in Mardin Province. In May, the company obtained an incentive package to build a 2.3-Mt/yr-capacity phosphate plant in Mardin that would produce six types of chemicals. When completed, the new Mardin complex would have the capacity to produce 690,000 t/yr of pyrite, 650,000 t/yr of sulfuric acid, 437,000 t/yr of concentrated phosphate rock, and 325,000 t/yr of superphosphate (Ekinci, 2014; Eti Bakır A.Ş., 2014d).

Soda Ash.—Eti Soda A.Ş. was Turkey's leading soda ash producer. The company operated the Beypazari trona ore bed in Ankara Province that reportedly had the second largest reserves of soda ash in the world. The start of Eti Soda's construction of its greenfield Kazan Soda soda ash production complex in Kazan, Ankara Province, was delayed in 2014 owing to construction permit and financing issues. The Kazan facility was planned to have a production capacity of 1.5 Mt/yr of soda ash by the completion of phase 1 of the project in the second half of 2017 and 2.5 Mt/yr across two production lines in phase 2 by the first half of 2018. Construction was expected to begin in

January 2015. Turkey aims to become a leading European soda ash producer if Kozan Soda begins operating in 2017 as planned (Ciner Holding, 2015; Industrial Minerals, 2015a).

Mineral Fuels, Related Materials, and Other Sources of Energy

In 2014, Turkey's total primary energy supply was provided by natural gas (32.5%), petroleum (26.2%), hard coal (16.3%), lignite coal (12.3%), hydropower (2.8%), coke (2.4%), and geothermal energy (2.8%). Domestic energy production came primarily from lignite coal (47.8%), followed by hydropower and geothermal energy (11.3% each), petroleum (8%), wood and biomass (7.3%), wind (2.4%), and natural gas (1.6%). Turkey was reliant on imports for most of its natural gas and crude petroleum consumption in 2014 (T.C. Enerji ve Tabii Kaynaklar Bakanlığı, 2015; Türkiye Petrolleri Anonim Ortaklığı, 2015a, p. 37–38).

Coal.—Coal, in particular hard coal and lignite, constituted the bulk of Turkey's indigenous energy resources. The country had an estimated 14.2 Gt of lignite and 1.3 Gt of hard coal reserves and resources, of which 13.9 Gt and 0.5 Gt, respectively, were proven reserves. Lignite constituted 95% of indigenous coal production, whereas hard coal accounted for only 5%. The private sector's share of total output had increased in recent years, whereas that of the Government-owned enterprises TKI and EÜAŞ had decreased owing to the ongoing privatization of coal mines. In 2014, TKI's share in total lignite production decreased to 26%, and that of EÜAŞ, to 50%; the private sector's share increased to 24%. The share of TTK (a third Government-owned coal producer) in total hard coal production increased to 73% in 2014 from 71% in 2013 and 64% in 2012. TTK's hard coal output, however, decreased by 5% to 1.3 Mt in 2014 compared with production in 2013 (Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü, 2015a, p. 32, 43; Türkiye Taşkömürü Kurumu, 2015b, p. 22–23; U.S. Energy Information Administration, 2015, p. 8–9).

EÜAŞ was in the process of evaluating an estimated 1.8 Gt of new lignite resources discovered in Karapinar, Konya Province in 2014. The company signed an agreement with Edison S.p.A. of Italy for Edison to conduct feasibility studies in the region. The development of the reserves would require an investment of about $8 billion. Also in 2014, companies from China, Japan, Qatar, and the Republic of Korea expressed interest in the construction and operation of a coal-based 8,000-megawatt (MW)-capacity powerplant in the Afsin-Elbistan region after Abu Dhabi National Energy Co. PdSC (TAQA) of the United Arab Emirates deferred its investment decision in late 2013. At a cost of between $12 and $14 billion, the construction of the powerplant would reportedly be the largest ever foreign investment made in Turkey. In September, the Government held official talks with the Government of Qatar about the project (Demirkan and Eryiğit, 2015, p. 176).

Natural Gas, Petroleum, and Refined Petroleum Products.—Turkey was estimated to hold proven petroleum reserves of 312 million barrels (Mbbl) and natural gas reserves of 5 billion cubic meters in 2014, which were estimated to last 17 years and 10 years, respectively. Most of the country's petroleum reserves were located in the southeast in Adiyaman and Batman Provinces; the remaining reserves were located in the northwest in Thrace. In 2014, Turkey's hydrocarbon production did not change significantly from previous years and supplied only a small portion of domestic consumption. Crude petroleum production amounted to 49,319 barrels per day (bbl/d) and met only 7% of domestic consumption of 718,000 bbl/d compared with 48,166 bbl/d of production and 714,000 bbl/d of consumption in 2013. Imports of crude petroleum decreased by 5% to 359,000 bbl/d, whereas imports of refined petroleum products increased by 7% to 310,000 bbl/d in 2014. Domestic natural gas production decreased to its lowest level in a decade to 502 million cubic meters in 2014 from 562 million cubic meters in 2013 owing to declining reserves. Natural gas production met only about 1.0% of domestic consumption of 49.8 billion cubic meters in 2014 compared with 1.2% in 2013. Turkey imported about 93% of its petroleum and 99% of its natural gas supplies in 2014. The main petroleum import sources were Iraq (which supplied 31% of Turkey's total petroleum imports), and Iran (30%), followed by Saudi Arabia (11%), and Nigeria (10%). The main natural gas import sources were Russia (which supplied 55% of total natural gas imports), followed by Iran (19%), and Azerbaijan and Algeria (9% each) (Enerji Piyasası Düzenleme Kurumu, 2015a, p. 7; Türkiye Petrolleri Anonim Ortaklığı, 2015a, p. 37–39, 43, 2015c; U.S. Energy Information Administration, 2015, p. 1, 2, 4, 5).

Domestic production of refined petroleum products took place in four refineries located in Batman, Izmir, Izmit, and Kirikkale Provinces; the refineries had a total (combined) distillation capacity of about 651,000 bbl/d. All four were owned by Türkiye Petrol Rafinerileri A.Ş. (Tüpraş). Diesel, unleaded gasoline, and jet fuel constituted 67% total refined products output. Their combined output decreased by 6.6% following a decrease of 3.0% in 2013. Total imports of refined products increased by 23% in 2014: imports of jet fuel increased by 60%, and those of diesel, by 26%. Two new refineries were planned. One refinery was being constructed in Izmir Province by Star Rafineri A.Ş. and was expected to begin operating in 2015. Another refinery was being planned in Yumurtalik in Adana Province by Doğu Akdeniz Petrokimya ve Rafineri Sanayi ve Ticaret A.Ş. The two refineries were expected to boost Turkey's total crude distillation capacity by 510,000 bbl/d to about 1.2 million barrels per day (International Energy Agency, 2014, p. 454; Enerji Piyasası Düzenleme Kurumu, 2015b, p. 7; Türkiye Petrol Rafinerileri A.Ş., 2015).

TPAO, which had preferential rights to undertake petroleum exploration and production in Turkey, accounted for 72% of domestic crude petroleum output and 50% of natural gas output in 2014. The company's production of petroleum primarily originated from oilfields in Batman (which accounted for 73% of total output), followed by Adiyaman (26%) and Thrace (1%). Production of natural gas took place primarily in Thrace, which accounted for 96% of the company's total natural gas output. In 2014, TPAO completed 233,500 m of drilling in 133 wells, accounting for 63% of total drilling in Turkey. TPAO also drilled most of the new hydrocarbon wells: it independently drilled 20 exploration wells, 31 identification wells, and 74 production wells, and, in partnership with other companies, 5, 7, and 1 well(s), respectively. Among the new wells, the Hopa-1, Istranca-1, Kastamonu-1, Sinop-1, Sürmene-1/1RE, and Yassıhöyük-1 wells, which were drilled in partnership with BP p.l.c. of the United Kingdom, Petrobras S.A. of Brazil, Exxon Mobil Corp. and Chevron Corp. of the United States in the Black Sea, yielded the most promising results. TPAO operated the 2.1-million-cubic-meter-per-day-capacity Akcakoca Platform in the western Black Sea, which produced an average of 250,000 to 300,000 cubic meters per day of natural gas. The company was also in the process of evaluating seismic results obtained off the coasts of Antalya and Mersin Provinces, Iskenderun district, and the country of Cyprus in the Mediterranean Sea (Enerji Piyasası Düzenleme Kurumu, 2015a, p. 5; Türkiye Petrolleri Anonim Ortaklığı, 2015a, p. 36, 41, 47, 48, 49; 2015c; U.S. Energy Information Administration, 2015, p. 2).

BOTAŞ dominated the natural gas market and accounted for about 80% of natural gas imports and most exports. It also operated all five of Turkey's hydrocarbon pipelines, which transported crude petroleum from Azerbaijan (through Georgia) and Iraq as well as within the country from Batman and Kirikkale Provinces to Ceyhan Port and Dortyol Port on the Mediterranean Sea coast. In 2014, the pipelines transported 353 Mbbl of crude petroleum. To secure Turkey's energy supply, BOTAŞ had in place long-term natural gas purchase agreements with Russia (20 billion cubic meters per year), Azerbaijan (12.75 billion cubic meters per year), and Iran (9.6 billion cubic meters per year), and liquefied natural gas (LNG) purchase agreements with Algeria (4.4 billion cubic meters per year) and Nigeria (1.3 billion cubic meters per year). Imports of 6 billion cubic meters of gas from Azerbaijan's Shah Deniz Faz-II field were scheduled to begin in 2018. Under the draft version of the amendment to the Natural Gas Market Law of 2014, BOTAŞ was required to reduce its share of imports to 20% of annual consumption by selling its imports contracts. Other companies would no longer be prohibited from importing natural gas from countries with which BOTAŞ was already contracted (Boru Hatları ile Petrol Taşıma A.Ş., 2015a, p. 22–24; Demirkan and Eryiğit, 2015, p. 173; U.S. Energy Information Administration, 2015, p. 5).

Shale Gas.—Turkey was estimated to have 1.8 trillion cubic meters of shale gas reserves, which is about 40 times the current rate of gas consumption. Shell Upstream Turkey, a joint venture of TPAO and Royal Dutch Shell plc of the United Kingdom and the Netherlands, continued with early-stage exploration targeting of a shale resource in Dadas located north of Diyarbakir Province. The company had finished drilling and testing its first two wells, Konacik-1 and Akcay-1, and was in the process of analyzing the results before engaging in further exploration activity to determine the existence of gas in commercially viable amounts. As of September, TPAO was in negotiations with ExxonMobil and planned to sign an agreement with Halliburton Co. of the United States for projects to explore for shale gas in Thrace (Demirkan and Eryiğit, 2015, p. 178; Royal Dutch Shell plc., 2015; U.S. Energy Information Administration, 2015, p. 2).

Thorium.—According to Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency and the International Atomic Energy Agency, Turkey had Europe's largest and the world's sixth largest identified thorium resources (after India, Brazil, Australia, United States, and Egypt) with 374,000 t in 2014. This is about 6% of the world's thorium resources. Eti Maden estimated Turkey's share of world thorium resources to be 14% and the average grade of the resources to be 0.2% ThO_2. The country's major thorium deposits are located in Sivrihisar in Eskisehir Province, Aksu in Isparta Province, and Hekimhan in Malatya Province. Eti Maden restarted resource exploration studies of the Sivrihisar deposit in 2011 and planned a resource development project for 2014–17, but no further updates were available (Bodur, 2012, p. 22–28; Organisation for Economic Co-operation and Development Nuclear Energy Agency and the International Atomic Energy Agency, 2014, p. 40; Birses, 2015, p. 44).

Uranium and Nuclear Energy.—In 2014, Turkey did not produce any uranium or nuclear energy. The country had identified uranium resources in at least five sites, among which the Temrezli deposit in Yozgat Province was the most significant. Uranium exploration activity was undertaken actively by private companies as well as by the MTA. In May, Anatolia Energy Ltd. of Australia, which owned 100% of the Temrezli in situ leach mining (ISL) uranium project, updated its economic assessment based on National Instrument 43–101 figures, reporting that costs would compare favorably with other ISL projects. As of yearend 2013, Temrezli had measured resources of 2,351 t of uranium (U) at a grade of 0.117% U, indicated resources of 2,004 t of uranium at a grade of 0.092% U, and inferred resources of 732 t of uranium at a grade of 0.075% U. Adur Madencilik Ltd. Şti., which was a subsidiary of Anatolia Energy, had obtained an operating license for the Temrezli deposit in October 2013, which was the first operating license ever granted to a uranium project in Turkey. The production license was expected to be issued in 2015 upon the completion of a prefeasibility study. Anatolia Energy also had three other prospects for uranium production as part of its Sefaatli uranium project—the Akcami, the Delier, and the Tulu Tepe prospects. Significant uranium mineralization had been discovered in Sefaatli in the 1980s. Anatolia Energy was in the process of conducting a drilling program on the Delier prospect to define resources. The company considered operating Sefaatli as a satellite of Temrezli (the two sites were located only 35 km away from one another (World Nuclear News, 2013; Organisation for Economic Co-operation and Development Nuclear Energy Agency and the International Atomic Energy Agency, 2014, p. 416–418; World Nuclear Association, 2016).

Turkey planned to build three nuclear powerplants—the Akkuyu, the Sinop, and the Igneada plants—as an essential component of the Government's new energy policy to reduce dependence on imported mineral fuels. With 4.8 gigawatts (GW) of electricity-generating capacity, these plants were expected to generate at least 6% of the country's electricity by 2023. The four-unit Akkuyu powerplant in Mersin Province on the Mediterranean Sea coast would be built, owned, and operated by Rosatom of Russia; it would have a life cycle of 60 years. In January, the site license for the plant was granted by the TAEK. In December, the EIA was approved by the Ministry of Environment and Urbanization. Construction was expected to begin in 2015, and the first unit was scheduled to be in operation in 2021. The four-unit Sinop powerplant in Sinop Province on the Black Sea coast would be built by

Mitsubishi Heavy Industries of Japan and Areva Group of France and operated by GdF Suez of France; it would have an electricity-generating capacity of 5 to 5.6 GW. In August, the Government concluded a Memorandum of Understanding (MOU) with the Government of Japan and signed the host-government agreement for the Sinop plant. In December, the MOU was submitted to the Parliament for ratification. The feasibility study for the Sinop plant was due in 2017, when construction was also scheduled to begin. The first unit was expected to be in operation by 2023. The ETKB also planned to commission the construction of a third nuclear powerplant, possibly in Igneada in Kirklareli Province in Thrace. In November, EÜAŞ began negotiations with the State Nuclear Power Technology Corp. (SNPTC) of China for the construction of a four-unit plant, which would use reactors from Westinghouse of the United States. Construction was expected to begin in 2019 at the earliest (T.C. Enerji ve Tabii Kaynaklar Bakanlığı, 2014, p. 39–41; Demirkan and Eryiğit, 2015, p. 176; U.S. Energy Information Administration, 2015, p. 9–10; World Nuclear Association, 2016).

Outlook

Turkey's mineral industry may resume an upward trajectory in terms of output and exports in 2015 after experiencing a slight decrease in the past 2 years if global mineral commodity prices stabilize and demand for Turkish mineral exports by its main trading partners, including China, the United States, the EU, and the countries of the Middle East and North Africa, increases. Although the gross value added by the mineral industry decreased in 2014, mineral extraction and processing activities are expected to contribute to an increasing share of the country's GDP in coming years, in part owing to new Government incentives for the industry. Numerous capacity expansion and modernization projects for such industrial minerals as boron, cement, feldspar, magnesite, phosphate rock, and soda ash, and for such metals as aluminum, molybdenum, and steel, are expected to be completed in the near future. Cobalt and nickel production are likely to increase substantially with the establishment of production facilities for each in Turkey. Although some were put on hold in 2014, multiple exploration and extraction projects in precious metals, such as copper, gold, and silver, may yield increased reserves and, subsequently, higher output in coming years. As a result, Turkey may account for an increasing percentage of world nonferrous metal output while also enhancing its role as a leading supplier of boron, cement, feldspar, marble, and steel. Uranium exploration remains at a relatively early stage; however, exploration efforts could increase, given the Government's emphasis on nuclear energy as an essential ingredient of the country's future energy supply. The new energy strategy also envisions reducing imports of natural gas and petroleum by 2019, but the attainment of that goal hinges on whether new reserves of mineral fuels, in particular reserves of coal and petroleum, are identified so that domestic production can be increased. Turkey is also expected to become more self-sufficient in other minerals that the country currently has to import to meet at least a portion of domestic demand, including aluminum, cobalt, iron ore, nickel, and zinc.

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TABLE 1
TURKEY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
METALS						
Aluminum		60,000	65,000 [r]	43,700 [r]	42,200 [r]	53,500 [e]
Antimony:						
Ore, mine output:						
Gross weight		25,974	43,340	131,839	83,553	55,791
Sb content[e]		1,400	2,400	7,300	4,600	3,100
Concentrates:[e]						
Gross weight		5,400	8,600	26,200	16,600	11,100
Sb content		1,300	2,200 [r]	6,600 [r]	4,200 [r]	2,800
Bauxite and alumina:						
Bauxite		1,311,064	1,024,915	1,521,150	795,562	1,091,442
Alumina, gross weight[e]		160,000	160,000	200,000	105,000	144,000
Chromium, gross weight (34% to 43% chromic oxide)[2]		1,900,000 [r]	2,900,000 [r]	3,600,000	3,200,000	2,900,000
Copper:						
Mine output, exclusive of pyrite:[3]						
Gross weight		5,469,844	5,687,058	7,684,052	7,983,438	6,422,445
Cu content of ore[e]		70,900 [r]	93,700 [r]	102,000 [r]	121,000 [r]	96,900
Metal:[e]						
Smelter output, primary and secondary		30,000 [r]	35,600 [r]	40,500 [r]	40,800 [r]	40,000
Refined		47,200 [r]	86,400 [r]	86,000 [r]	91,200 [r]	91,000
Gold, metal, refined	kilograms	17,000 [r]	24,600 [r]	29,500 [r]	33,500 [r]	31,300
Iron and steel:						
Iron ore:						
Gross weight	thousand metric tons	5,814	6,450	6,557 [r]	8,492 [r]	6,982
Fe content[e]	do.	3,000	3,400	3,500 [r]	4,500	3,700
Metal:						
Pig iron and ferroalloys:						
Pig iron		7,679,000 [r]	8,173,000	8,613,000	9,180,000	9,364,000
Ferrochromium[e]		50,000	53,000 [r]	56,000 [r]	60,000 [r]	61,000
Ferrosilicon[e]		1,000	2,000	2,000	2,500 [r]	2,500
Steel, crude, including castings	thousand metric tons	29,143 [r]	34,107 [r]	35,885 [r]	34,654 [r]	34,035
Lead:						
Mine output, Pb and Pb-Zn ores:						
Gross weight		526,277	1,044,222	1,076,088	1,491,669	2,206,054
Pb content[e]		23,000	40,000	46,000	64,000	95,000
Concentrates:[e]						
Gross weight		40,000	78,000	80,000	111,000	165,000
Pb content		26,000 [r]	46,000 [r]	47,000 [r]	66,000 [r]	98,000
Manganese ore, gross weight[4]		134,336	172,248	192,756	321,785	245,830
Molybdenum, Mo content		--	400 [e]	600 [e]	800 [e]	900 [e]
Nickel, mine output, Ni content[e]		1,900 [r]	4,300 [r]	3,500 [r]	1,100 [r]	3,000
Silver, mine output, Ag content	kilograms	363,520	246,500	193,890	189,600	183,880
Zinc, mine output, Zn and Cu-Zn ore:						
Gross weight	thousand metric tons	421 [r]	793	1,035 [r]	991 [r]	1,041
Zn content[e]	do.	85 [r]	160 [r]	209 [r]	200 [r]	210
INDUSTRIAL MINERALS						
Aluminum sulfate, alunite		433,310	--	--	13,568	--
Barite, crude		172,618	250,786	1,677,221	736,316	203,984
Boron minerals:						
Run of mine		4,520,000 [r]	6,348,487	5,660,000 [r]	5,730,000 [r]	7,309,708
Concentrates		2,220,000	2,130,000	2,220,000 [r]	2,000,000 [r]	1,870,000
Refined borates		1,400,000	1,780,000	1,790,000 [r]	1,780,000 [r]	1,990,000
Calcite		6,629,005	10,084,119	9,248,471	9,727,092	11,054,222

See footnotes at end of table.

TABLE 1—Continued

TURKEY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued						
Cement, hydraulic	thousand metric tons	62,737	63,405	63,879	71,337	71,329
Clinker	do.	52,832	54,275	54,823	60,236	62,513
Chalcedony		1,814	896	2,287	2,249	1,689
Clays:						
Bentonite		798,397	471,528	1,033,568	622,872	1,088,444
Kaolin		787,287	1,229,352	988,081	1,168,441	2,032,103
Other		4,030,961	3,747,503	4,119,513	3,411,915	4,445,962
Total		5,616,645	5,448,383	6,141,162	5,203,228	7,566,509
Diatomite		18,448	45,187	86,403	84,571	61,884
Emery		67,989	113,602	54,848	43,776	38,816
Feldspar, run of mine		6,281,597	7,076,068 [r]	9,479,699 [r]	13,764,126 [r]	7,960,844
Fluorspar		25,189	4,524	5,197	3,874	4,271
Graphite, run of mine		--	5,250	31,500	28,740	3,850
Gypsum, other than that for cement		6,321,891	5,723,439	8,248,446	9,790,097	9,051,158
Leonardite		--	--	--	5,737	2,996
Lime[5, e]	thousand metric tons	4,300	4,300	4,500	4,400 [r]	4,300
Magnesium, magnesite, run of mine		2,316,763	2,588,276	2,475,828	2,597,465	2,377,157
Mica:						
Illite		35,622	17,265	--	800	16,200
Other		387	277	1,253	1,504	9,240
Nepheline syenite		1,308	1,500	4,000	404	2,241
Nitrogen, N content of ammonia[e]		200,000	200,000	280,000	280,000	300,000
Obsidian		106	300	1,230	3,240	400
Olivine		192,394	221,079	244,353	126,990	244,138
Peat		214,620	148,012	108,610	156,357	150,828
Perlite, run of mine		545,585	702,673	887,600	1,075,949	897,125
Phosphate rock		--	--	--	510,080	604,000
Pumice		4,198,751	5,822,501	4,556,632	5,159,047	6,710,170
Pyrites, cupreous, gross weight		131,315	135,190	124,000	107,792	95,220
Quartz and quartzite		2,542,372	4,367,678	3,430,404	3,957,836	3,494,347
Sepiolite (meerschaum) and palygorskite (attapulgite)		16,342	30,716	31,180	59,426	52,658
Silica (quartz) sand		4,022,433	7,020,622	7,085,380	7,969,392	10,258,912
Sodium compounds:						
Salt, NaCl, all types	thousand metric tons	4,044	6,546	5,255	5,565	5,932
Soda ash, trona	do.	1,623	1,749	1,853	1,665	1,828
Sodium sulfate		1,600,603	2,491,441	1,366,179	1,000,150	779,894
Stone:						
Basalt		1,837,450 [r]	1,830,672 [r]	3,196,140 [r]	3,328,929 [r]	3,739,116
Diabase		1,969	293,777	94,835	335,958	226,939
Dolomite		15,224,546	20,340,135	16,950,670	17,291,454	15,743,710
Granite		239,819	245,911	566,650	896,348	1,219,916
Limestone, for cement	thousand metric tons	270,441	345,014	365,348	392,352	382,404
Marble	cubic meters	3,352,070	4,086,222	4,488,947	4,255,545	4,220,564
Onyx	do.	2,113	7,678	13,335	15,665	10,688
Sandstone		8,908,971	6,127,433	6,356,666	10,453,003	9,609,882
Serpentine		26,745	2,514,601	1,025,427	14,701	13,112
Travertine	cubic meters	879,319	1,685,049	797,915	713,697	812,840
Sulfur:						
Byproduct of petroleum		427	3,820	5,889	8,069	8,000 [e]
S content of pyrites[e]		34,000	35,000	32,000	28,000	25,000
Total		34,400	38,800	37,900	36,069	25,000
Talc		1,826	9,959	14,537	1,132	5,048
Titanium minerals, rutile, gross weight		1,000	--	5,000	5,000	5,000
Zeolites		33,813	214,179	60,258	33,197	49,366
Zirconium		--	500	200	--	1,100

See footnotes at end of table.

TABLE 1—Continued
TURKEY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014
MINERAL FUELS AND RELATED MATERIALS						
Asphalt, natural		285,362	572,089	649,830	648,953	336,852
Coal:						
Hard coal, run of mine	thousand metric tons	2,727	2,619	3,235	2,789	1,917
Lignite, run of mine	do.	81,957	82,375	78,014	63,324	65,739
Coke and semicoke[e]	do.	3,900	4,000	4,000	4,000	3,500
Gas, natural, marketed	million cubic meters	726 [r]	793 [r]	664 [r]	562 [r]	502
Petroleum:[e]						
Crude	thousand 42-gallon barrels	18,300 [r]	17,400 [r]	17,100 [r]	17,600 [r]	18,000
Refinery products:						
Liquefied petroleum gas	do.	7,900	8,800	9,100 [r]	9,200 [r]	8,100
Gasoline	do.	33,400 [r]	35,200 [r]	37,700 [r]	36,800 [r]	34,900
Naphtha	do.	4,000	4,000	3,500	3,500	3,000
Jet fuel and kerosene	do.	21,100 [r]	23,200 [r]	26,400 [r]	28,800 [r]	28,600
Distillate fuel oil	do.	41,900 [r]	45,300 [r]	47,400 [r]	48,100 [r]	45,300
Lubricants	do.	2,200	2,800	1,900 [r]	1,000 [r]	800
Residual fuel oil	do.	17,900 [r]	16,100 [r]	10,200 [r]	10,200 [r]	10,000
Asphalt	do.	16,900	17,900 [r]	17,000 [r]	17,700 [r]	11,600
Unspecified[6]	do.	4,300 [r]	4,900 [r]	5,400 [r]	4,000 [r]	3,500
Total	do.	150,000 [r]	158,000 [r]	159,000 [r]	159,000 [r]	146,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1] Table includes data available through February 16, 2016.

[2] Approximately 70% of gross production is salable product.

[3] Copper mines produce a copper concentrate (of about 22% Cu) and a cupreous pyrite concentrate (of about 0.7% Cu). Copper is not recovered from the cupreous pyrite concentrate.

[4] Does not include manganiferous iron ore from the Deveci Mine, production of which amounts to several hundred thousand metric tons per year and has a manganese content of 3% to 5%.

[5] Estimated sales only.

[6] Includes refinery fuel and losses.

TABLE 2
TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, metal	Eti Alüminyum A.Ş. (Cengiz Holding A.Ş., 100%)	Smelter at Seydisehir, Konya Province	70
Antimony ore, Sb content	Eti Bakır A.Ş. (Cengiz Holding A.Ş., 100%)	Halikoy, Izmir Province	100
Do.	Özdemir Antimuan Maden Limited Şti. (Koza-İpek Holding A.Ş.)	Turhal, Tokat Province	NA
Bauxite and alumina:			
Alumina	do.	Refinery at Seydisehir, Konya Province	270
Bauxite	do.	Mines near Madenli, about 25 kilometers south of Seydisehir, Konya Province	500
Do.	Demireller Tarim Madencilik Petrol Sanayi ve Ticaret Limited Şti.	Mines near Arslankoy, Mersin Province	500
Do.	Albuck Madencilik San. ve Tic. A.Ş.	Mine near Cirpi, Mugla Province	NA
Do.	do.	Mine near Mihaliccik, Eskisehir Province	NA
Boron:			
Concentrate and ground ore	Bigadiç Bor İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü, 100%) (Government)	Four open pit mines at Bigadic, Balikesir Province	650
Do.	Emet Bor İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü, 100%) (Government)	Espey Mine, Emet, Kutahya Province	500
Do.	do.	Hisarcik Mine, Emet, Kutahya Province	500
Do.	Kestelek Bor İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü, 100%) (Government)	Kestelek Mine, Bursa Province	100
Do.	Kırka Bor İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü, 100%) (Government)	Mine at Kirka, Eskisehir Province	800
Refined borates	Bandırma Bor ve Asit Fabrikalari İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü, 100%) (Government)	Plant at Bandirma, Balikesir Province	115
Do.	Emet Bor İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü, 100%) (Government)	Boric acid complex, Emet, Kutahya Province	290
Do.	Kırka Bor İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü), 100% (Government)	Plant at Kirka, Eskisehir Province	840
Calcite	Hisar Madencilik (Kombassan Holding, 100%)	2 plants in Aksaray and Aydin	120
Cement:			
Gray portland	Adana Çimento Sanayii ve Ticaret A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 57%]	Adana, Adana Province	5,500
Do.	do.	Iskenderun grinding plant, Iskenderun, Hatay Province	1,000
Do.	Afyon Çimento Sanayii Ticaret A.Ş. (Ciments Français S.A., 77%)	Afyon, Afyonkarahisar Province	550
Do.	Akçansa Çimento Sanayi ve Ticaret A.Ş. (HeidelbergCement AG, 40%, and Sabancı Holding A.Ş., 40%)	Buyukcekmece plant, Buyukcekmece, Istanbul Province	2,600
Do.	do.	Canakkale plant, about 11 kilometers northwest of Ezine, Canakkale Province	5,500
Do.	do.	Ladik plant, Ladik, Samsun Province	1,050
Do.	Aslan Çimento A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 97%]	Darica plant, Gebze, Kocaeli Province	2,000
Do.	AS Çimento Sanayi ve Ticaret A.Ş.	Bucak, Burdur Province	4,300
Do.	Aşkale Çimento Sanayi ve Ticaret A.Ş.	Trabzon plant, Degirmendere, Trabzon Province	1,000
Do.	do.	Askale, Erzurum Province	900
Do.	Bakırçay Çimento Sanayii ve Ticaret A.Ş. (Kars Çimento San. ve Tic. A.Ş., 98%)	Poyracik, near Kinik, Izmir Province	12
Do.	Bartın Çimento Sanayii ve Ticaret A.Ş. (Sanko Holding A.Ş.)	Bartin plant, Bartin Province	400
Do.	Baştaş Çimento Sanayii A.Ş. (Vicat Group, 85%)	Elmadag, Ankara Province	1,500
Do.	Batıçim Batı Anadolu Çimento Sanayii A.Ş. (Orascom Construction Industries, 23%)	Bornova, Izmir Province	2,000
Do.	Batısöke Söke Çimento Sanayii ve Ticaret A.Ş. (Batıçim Batı Anadolu Çimento Sanayii A.Ş., 75%)	Soke, Aydin Province	1,300
Do.	Bolu Çimento Sanayii A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 52%]	About 14 kilometers east of Bolu, Bolu Province	5,500
Do.	do.	Ankara grinding plant, Kazan, Ankara Province	800
Do.	Bursa Çimento Sanayii ve Ticaret A.Ş. (Bursa Çimento Fabrikası A.Ş., 98%)	Kestel, Bursa Province	3,000

See footnotes at end of table.

TABLE 2—Continued
TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued:			
Gray portland—Continued	Çimentaş İzmir Çimento Fabrikası Türk A.Ş. (Intercem SA, 67%, and Cementir Holding SpA, 29%)	Isikkent, Izmir Province	2,600
Do.	do.	Trakya plant, Lalapasa, Edirne Province	1,300
Do.	Çimko Adıyaman Çimento ve Beton Sanayii ve Ticaret A.Ş. (Çimko Çimento ve Beton Sanayii Ticaret A.Ş.)	About 18 kilometers southwest of Adiyaman, Adiyaman Province	1,350
Do.	Çimko Çimento Kahramanmaraş Narlı Fabrikası (Çimko Çimento ve Beton Sanayii Ticaret A.Ş.)	Narli plant, Narli, Kahramanmaras Province	3,300
Do.	Cimpor Yibitaş Çimento Sanayii ve Ticaret A.Ş. (Cimpor Internacional, SGPS, S.A., 99%)	Corum plant, Corum, Corum Province	950
Do.	do.	Hasanoglan grinding plant, Hasanoglan, Ankara Province	725
Do.	do.	Nevsehir grinding plant, Kalaba, Nevsehir Province	300 [e]
Do.	do.	Samsun grinding plant, about 6 kilometers west of Samsun, Samsun Province	300 [e]
Do.	do.	Sivas plant, Sivas, Sivas Province	615
Do.	do.	Yozgat plant, Saraykoy, Yozgat Province	800
Do.	Çimsa Çimento Sanayii ve Ticaret A.Ş. (Sabancı Holding A.Ş., 47%)	Ankara grinding plant, Lalahan, Ankara Province	230
Do.	do.	About 20 kilometers northwest of Eskisehir, Eskisehir Province	1,800
Do.	do.	Near Agirnas, Kayseri Province	1,000
Do.	do.	Mersin plant, Yenitaskent, Mersin Province	2,300
Do.	do.	Nigde plant, Nigde, Nigde Province	1,200
Do.	Denizli Çimento Sanayi ve Ticaret A.Ş. (OYAK, 100%)	About 5 kilometers northwest of Kaklik, Denizli Province	3,000
Do.	Elazığ Çimento A.Ş. (Kars Çimento Sanayii ve Ticaret A.Ş., 93.55%; Cimentas A.Ş., 6.17%; Bakırçay Çimento Sanayii ve Ticaret A.Ş., 0.27%)	Elazig, Elazig Province	900
Do.	Ereğli Çimento Sanayii ve Ticaret A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 50%]	Karadeniz Eregli plant, Kemer, Zonguldak Province	300
Do.	Göltaş Çimento A.Ş. (Sadecib S.A., 34%, and Göl Yatırım Holding A.Ş., 28%)	About 15 kilometers north-northwest of Isparta, Isparta Province	2,000
Do.	Kars Çimento Sanayii ve Ticaret A.Ş. (Cimentas A.Ş., 58%, and Alfacem Srl, 40%)	Bozkale, Kars Province	2,800
Do.	Konya Çimento Sanayii A.Ş. (Vicat Group, 81%)	Konya, Konya Province	1,600
Do.	Lafarge Van Çimento A.Ş. (Lafarge S.A., 99.99%)	Edremit, Van Province	600
Do.	Limak Ege Çimento Sanayii ve Ticaret A.Ş. (Limak Şirketler Grubu)	Ege plant, Turgutlu, Manisa Province	700
Do.	Limak Kurtalan Çimento Sanayii ve Ticaret A.Ş. (Limak Şirketler Grubu)	Ambarli grinding plant, Buyukcekmece, Istanbul Province	1,200
Do.	do.	Ankara plant, Ankara, Ankara Province	1,600
Do.	do.	Balikesir, Balikesir Province	1,300
Do.	do.	Gaziantep plant, Gaziantep (Sehit Kamil), Gaziantep Province	1,400
Do.	do.	Kurtalan plant, Kurtalan, Siirt Province	1,200
Do.	do.	Mardin, Balikesir Province	790
Do.	do.	Sanliurfa plant, about 14 kilometers north-northwest of Sanliurfa, Sanliurfa Province	2,150
Do.	do.	Trakya plant, Pinarhisar, Kirklareli Province	1,600
Do.	Limak Madencilik Yapı Çimento Sanayii ve Ticaret A.Ş. (Limak Şirketler Grubu)	Ergani plant, Ergani, Diyarbakir Province	1,400
Do.	Limak-Istaç Inşaat Sanayi ve Ticaret A.Ş.	Bitlis plant, Bitlis Province	1,000
Do.	Mardin Çimento Sanayii ve Ticaret A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 56%]	About 6 kilometers northeast of Mardin, Mardin Province	3,000

See footnotes at end of table.

TABLE 2—Continued
TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued:			
Gray portland—Continued	Nuh Çimento Sanayi A.Ş. (Nuh Ticaret ve Sanayi A.Ş., 43%)	Hereke, Kocaeli Province	5,700
Do.	Traçim Çimento Sanayii ve Ticaret A.Ş. (Soyak Holding A.Ş. and TBS Taşıma Beton A.Ş).	Evrencik, Vize, Kirklareli Province	2,000
Do.	Ünye Çimento Sanayi ve Ticaret A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 51%, and Nuh Çimento Sanayi A.Ş., 39%]	Unye, Ordu Province	2,600
Slag	KarÇimsa Çimento Sanayii ve Ticaret A.Ş. (Akçansa Çimento Sanayi ve Ticaret A.Ş.)	Karabuk, Karabuk Province	200
White	Adana Çimento Sanayii ve Ticaret A.Ş. [Ordu Yardımlaşma Kurumu (OYAK) Çimento Grubu, 57%]	Adana, Adana Province	325
Do.	Çimsa Çimento Sanayii ve Ticaret A.Ş. (Sabancı Holding A.Ş., 47%)	Mersin plant, Yenitaskent, Mersin Province	1,000 [e]
Chromium	Eti Krom A.Ş. (Yildrim Holding A.Ş., 100%)	Mines in Adana, Diyarbakir, Elazig, Hatay, Kayseri, and Malatya Provinces	1,000
Coal:			
Anthracite (hard)	Amasra Taskömürü Isletme Müessesesi [Türkiye Taşkömürü Kurumu (TTK)] (Government)	Amasra Mine, Amasra, Bartin Province	5,000
Do.	Armutçuk Taskömürü Isletme Müessesesi [Türkiye Taşkömürü Kurumu (TTK)] (Government)	Armutcuk Mine, Kandilli, Zonguldak Province	400
Do.	Karadon Taskömürü Isletme Müessesesi [Türkiye Taşkömürü Kurumu (TTK)] (Government)	Karadon Mine, Kilimli, Zonguldak Province	450
Do.	Kozllu Taskömürü Isletme Müessesesi [Türkiye Taşkömürü Kurumu (TTK)] (Government)	Kozlu Mine, Kozlu, Zonguldak Province	600
Do.	Üzülmez Taskömürü Isletme Müessesesi [Türkiye Taşkömürü Kurumu (TTK)] (Government)	Uzulmez Mine, Asma, Zonguldak Province	500
Lignite[1]	Bursa Linyitleri İşletmesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Bursa lignite facility, Orhaneli, Bursa Province	1,000
Do.	Çan Linyitleri İşletmesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Can lignite facility, Can, Canakkale Province	1,800
Do.	Ege Linyitleri İşletmesi Müessesesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Soma Mine, Soma, Manisa Province	10,500
Do.	Garp Linyitleri İşletmesi Müessesesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Tuncbilek mining center, Tavsanli, Kutahya Province	7,000
Do.	Güney Ege Linyitleri İşletmesi Müessesesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	South Aegean lignite facility, Yatagan, Mugla Province	4,900
Do.	Ilgın Linyitleri İşletmesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Ilgin lignite facility, Ilgin, Konya Province	300
Do.	Seyitömer Linyitleri İşletmesi Müessesesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Seyitomer lignite facility, Seyitomer, Kutahya Province	8,000
Do.	Yeniköy Linyitleri İşletmesi Müdürlüğü [Türkiye Kömür İşletmeleri Kurumu Genel Müdürlüğü (TKI)] (Government)	Yenikoy lignite facility, Oren (Milas), Mugla Province	8,500
Copper:			
Concentrate, Cu content	Çayeli Bakir İşletmeleri A.Ş. (First Quantum Minerals Ltd., 100%)	Cayeli Mine, near Cayeli, Rize Province	37
Do.	Demir Export A.Ş. (Koç Holding A.Ş.)	Lahanos Mine, Giresun Province	4
Do.	Eti Bakır A.Ş. (Cengiz Holding A.Ş., 100%)	Kastamonu Kure facility (three open pit mines and one underground mine), 50 kilometers north of Kastamonu, Kastamonu Province	110
Do.	Eti Bakır A.Ş. (Cengiz Holding A.Ş., 100%)	Murgul facility (three open pit mines, including the Anayatak and the Cakmakkaya Mines), Murgul, Artvin Province	130
Do.	Kuzey Ege Bakır İşletmeleri A.Ş. (Özdoğu İnşaat Tic. Ltd. Şti, 100%)	Tepeoba, Balikesir Province	55
Do.	Nesko Maden (Yildizlar SSS Holding, 100%)	Ivrindi facility, Balikesir Province	NA
Do.	do.	Kocayayla Mine, Canakkale Province	NA
Do.	do.	Yenice Mine, Canakkale Province	NA

See footnotes at end of table.

TABLE 2—Continued

TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Copper—Continued:			
Concentrate, Cu content—Continued	Park Elektrik Üretim Madencilik San. ve Tic. A.Ş. (Park Holding A.Ş., 61.24%; Turgay Ciner, 6.76%; others, 32%)	Madenkoy, Siirt Province	20
Anode (blister)	Eti Bakır A.Ş. (Cengiz Holding A.Ş)	Smelter, Tekkekoy, Samsun Province	38
Cathode	Er-Bakır Elektrolitik Bakır Mamulleri A.Ş.	Denizli, Denizli Province	200
Do.	Sarkuysan Elektrolitik Bakır San. ve Tic. A.Ş.	Darica, Kocaeli Province	200
Feldspar	Kaltun Madencilik Sanayi ve Ticaret A.Ş.	Cine, Milas, Yatagan Mines, Mugla Province	2,000
Ferrochromium, high-carbon	Eti Krom A.Ş. (Yildrim Holding A.Ş., 100%)	About 55 kilometers east of Elazig, Elazig Province	150
Do.	Eti Elektrometalurji A.Ş. (Özdoğu İnşaat Tic. Ltd. Şti, 100%)	12 mines in Mugla, Fethiye, and Gocek	100
Fertilizer:			
Ammonium nitrate	Kütahya Gübre Sanayii A.Ş. (Yildiz Yatirim Holding A.Ş.)	Kutahya, Kutahya Province	344
Diammonium phosphate	Samsun Gübre Fabrikası [Türkiye Gübre Sanayii A.Ş. (TÜGSAŞ)]	Tekkekoy, Samsun Province	227
Do.	Ege Gübre Sanayii A.Ş.	Aliaga, Izmir Province	165
Do.	Istanbul Gubre Sanayi A.Ş. (IGSAŞ) (Yildiz Yatirim Holding A.Ş.)	Korfez, Kocaeli Province	240
Monoammonium phosphate	Ege Gübre Sanayii A.Ş.	Aliaga, Izmir Province	130
Gold:			
Ore, Au content kilograms	Koza Altın İşletmeleri A.Ş. (ATP İnşaat ve Ticaret A.Ş., 60%, and Koza İpek Holding A.Ş., 40%)	Ovacik Mine, Ovacik, Mugla Province	2,000
Do. do.	do.	Mastra Mine, near Demirkaynak, Gumushane Province	5,000
Do. do.	do.	Cukuralan Mine, Dikili, Izmir Province[2]	3,800
Do. do.	do.	Corakliktepe Mine, Ovacik, Mugla Province	500
Do. do.	do.	Hitmmetdede Mine, Kayseri Province	NA
Do. do.	do.	Kaymaz Mine, Sivrihisar, Eskisehir Province	3,300
Do. do.	Anagold Madencilik Sanayi ve Ticaret A.Ş. (Alacer Gold Corp., 80%, and Lidya Madencilik Sanayi ve Ticaret A.Ş., 20%)	Copler Mine	6,000
Do. do.	Gümüştaş Madencilik ve Ticaret A.Ş.	Niğde-Bolkar Mine, Nigde Province	NA
Do. do.	Pomzaexport Madencilik Sanayi ve Ticaret A.Ş.	Sart placer mine, Manisa Province	NA
Do. do.	Tüprag Metal Madencilik Sanayi ve Ticaret A.Ş. (Eldorado Gold Corp., 100%)	Kisladag Mine, Katranci, Usak Province	10,000
Do. do.	do.	Efemcukuru Mine, Izmir Province	4,000
Metal metric tons	Atasay Kuyumculuk Sanayi ve Ticaret A.S.	Refinery at Istanbul	15
Do. do.	İstanbul Altın Rafinerisi A.Ş.	do.	120
Do. do.	Nadir Metal Rafineri A.Ş.	do.	140
Iron and steel:			
Iron ore	Erdemir Madencilik Sanayi ve Ticaret A.Ş. (Ereğli Demir ve Çelik Fabrikalari T.A.Ş.) (Erdemir Group)	Fourteen mines in the Divrigi area, Sivas Province	2,900
Do.	Hekimhan Madencilik İthalat İhracat Sanayi ve Ticaret Ltd. Şti. (Kolin İnşaat Turizm Sanayi ve Ticaret A.Ş.)	Deveci Mine, Malatya Province	2,000
Do.	Özkoyuncu Madencilik A.Ş.	Mines in Yahyali, Kayseri Province	2,000
Steel:			
Crude	Asil Çelik A.Ş.	Plant south of Orhangazi, Bursa Province	485
Do.	Bilecik Demir Çelik Sanayi ve Ticaret A.Ş. (Global Yatırım Holding A.Ş., 40%)	Bilecik, Bilecik Province	240
Do.	Çebitaş Demir Çelik Endüstrisi A.Ş.	Aliaga, Izmir Province	750
Do.	Çelik Makina Sanayi ve Ticaret A.Ş. (ÇEMTAŞ)	Bursa, Bursa Province	174
Do.	CER Çelik Endüstrisi A.Ş.	Plant at Bornova, Izmir Province	850
Do.	Çolakoğlu Metalurji A.Ş.	Dilovasi, Kocaeli Province	3,200
Do.	Diler Demir Çelik Endüstrisi ve Ticaret A.Ş.	do.	1,500
Do.	Ege Çelik Endüstrisi Sanayi ve Ticaret A.Ş.	Aliaga, Izmir Province	2,000
Do.	Ekinciler Holding A.Ş.	About 10 kilometers north of Iskenderun, Hatay Province	1,000
Do.	Erege Metal Demir Çelik Sanayi ve Ticaret A.Ş.	Aliaga, Izmir Province	720
Do.	Ereğli Demir ve Çelik Fabrikalari T.A.Ş. (Erdemir Group) (Ataer Holding A.Ş., 49.29%, and ArcelorMittal, 24.99%)	Karadeniz Eregli, Zonguldak Province	3,800
Do.	Habaş Sinai ve Tibbi Gazlar Istihsal Endustrisi A.S. (Habaş Topluluğu)	Aliaga, Izmir Province	3,000
Do.	İçdaş Demir Çelik Enerji Tersane ve Ulaşım Sanayi A.Ş.	Istanbul (Gunesli), Istanbul Province	1,000

See footnotes at end of table.

TABLE 2—Continued
TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel—Continued:			
Steel—Continued:			
Crude—Continued	İçdaş Demir Çelik Enerji Tersane ve Ulaşım Sanayi A.Ş.	About 25 kilometers north of Biga, Canakkale Province	1,500
Do.	İlhan Metalurji A.Ş.	Toprakkale, Osmaniye Province	220
Do.	İskenderun Demir ve Çelik A.Ş. (Isdemir) [Erdemir Group, 92%]	Iskenderun, Hatay Province	4,700
Do.	İzmir Demir Çelik Sanayi A.Ş. (IDÇ)	Aliaga, Izmir Province	1,320
Do.	Kaptan Demir Çelik Endüstrisi ve Ticaret A.Ş.	Marmara Ereglisi, Tekirdag Province	1,400
Do.	Karabük Demir Çelik Sanayi ve Ticaret A.Ş. (Kardemir) (Kardemir retirement group, 68%, and Kardemir employees, 21%)	Karabuk, Karabuk Province	1,500
Do.	Kroman Çelik Sanayii A.Ş.	Cayirova, Kocaeli Province	1,250
Do.	Makina ve Kimya Endüstrisi Kurumu Genel Müdürlüğü (MKEK)	Kirikkale, Kirikkale Province	60
Do.	Mega Demir Mamulleri Sanayi ve Ticaret Ltd. ŞTI	North of Iskenderun, Hatay Province	220
Do.	Nursan Metalurji A.Ş	Payas, Hatay Province	1,100
Do.	Sivas Demir Çelik İşletmeleri A.Ş (Sidemir)	About 20 kilometers south of Sivas, Sivas Province	350
Do.	Tosyalı Demir Çelik Sanayi A.Ş. (Tosyalı Holding A.Ş.)	Iskenderun, Hatay Province	NA
Do.	Yazıcı Demir Çelik Endüstrisi ve Ticaret A.Ş. (Diler Demir Çelik Endüstrisi ve Ticaret A.Ş.)	Karabuk, Karabuk Province	900
Do.	Yeşilyurt Demir Çelik A.Ş.	Tekkekoy, Samsun Province	1,300
Rolled products	Asil Çelik A.Ş.	Rolling mill south of Orhangazi, Bursa Province	200
Do.	Borçelik Çelik Sanayii ve Ticaret A.Ş. (ArcelorMittal and Borusan Holding A.Ş.)	Near Gemlik, Bursa Province	1,600
Do.	Çebitaş Demir Çelik Endüstrisi A.Ş.	Aliaga, Izmir Province	600
Do.	Çelik Makina Sanayi ve Ticaret A.Ş. (ÇEMTAŞ)	Bursa, Bursa Province	230
Do.	CER Çelik Endüstrisi A.Ş.	Rolling mill at Bornova, Izmir Province	300
Do.	Çolakoğlu Metalurji A.Ş.	Dilovasi, Kocaeli Province	750
Do.	Demirsan Haddecilik Sanayi ve Ticaret A.Ş.	do.	NA
Do.	Diler Demir Çelik Endüstrisi ve Ticaret A.Ş.	do.	800
Do.	Ege Çelik Endüstrisi Sanayi ve Ticaret A.Ş.	Aliaga, Izmir Province	1,200
Do.	Ekinciler Holding A.Ş.	About 10 kilometers north of Iskenderun, Hatay Province	1,100
Do.	Erege Metal Demir Çelik Sanayi ve Ticaret A.Ş.	Aliaga, Izmir Province	400
Do.	Ereğli Demir ve Çelik Fabrikalari T.A.Ş. (Erdemir) (Ataer Holding A.Ş., 49.29%, and ArcelorMittal, 24.99%)	Karadeniz Eregli, Zonguldak Province	8,800
Do.	Habaş Sinai ve Tibbi Gazlar Istihsal Endustrisi A.S. (Habaş Topluluğu)	Aliaga, Izmir Province	NA
Do.	İçdaş Demir Çelik Enerji Tersane ve Ulaşım Sanayi A.Ş.	Istanbul (Gunesli), Istanbul Province	1,500
Do.	do.	About 25 kilometers north of Biga, Canakkale Province	1,500
Do.	Intermet A.Ş.	Two rolling mills, Istanbul, Istanbul Province	600
Do.	İskenderun Demir ve Çelik A.Ş. (Isdemir) [Ereğli Demir ve Çelik Fabrikalari T.A.Ş. (Erdemir), 92%]	Iskenderun, Hatay Province	3,500
Do.	İzmir Demir Çelik Sanayi A.Ş. (IDÇ)	Aliaga, Izmir Province	900
Do.	Kaptan Demir Çelik Endüstrisi ve Ticaret A.Ş.	Marmara Ereglisi, Tekirdag Province	700
Do.	do.	Corlu, Tekirdag Province	200
Do.	do.	Karabuk, Karabuk Province	100
Do.	Karabük Demir Çelik Sanayi ve Ticaret A.Ş. (Kardemir) (Kardemir retirement group, 68%, and Kardemir employees, 21%)	do.	700
Do.	Kar-demir Haddecilik Sanayi ve Ticaret Ltd. ŞTI	Aliaga, Izmir Province	700
Do.	Kocaer Haddecilik Sanayi ve Ticaret Ltd. ŞTI. (Kocaer Grubu)	do.	600
Do.	do.	Denizli, Denizli Province	100
Do.	Kroman Çelik Sanayii A.Ş.	Bar and profile mill at Cayirova, Kocaeli Province	200
Do.	Kürüm Demir Sanayi Dış Ticaret A.Ş.	Gebze, Kocaeli Province	445
Do.	Nursan Haddecilik A.Ş	Payas, Hatay Province	500
Do.	Özefe Demir Sanayi ve Tic A.Ş. (Efesan Demir Sanayi ve Ticaret A.Ş.)	Bar mills at Alibeykoy, Istanbul Province	250

See footnotes at end of table.

TABLE 2—Continued
TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel—Continued:				
Steel—Continued:				
Rolled products—Continued		Özkan Demir Sanayi A.Ş.	Aliaga, Izmir Province	500
Do.		Sivas Demir Çelik İşletmeleri A.Ş (Sidemir)	About 20 kilometers south of Sivas, Sivas Province	450
Do.		Sözer Demir Çelik A.Ş.	Aliaga, Izmir Province	220
Do.		Yazıcı Demir Çelik Endüstrisi ve Ticaret A.Ş. (Diler Demir Çelik Endüstrisi ve Ticaret A.Ş.)	Karabuk, Karabuk Province	1,024
Do.		Yeşilyurt Demir Çelik A.Ş.	Tekkekoy, Samsun Province	720
Liquefied natural gas	million cubic meters	Boru Hatları İle Petrol Taşıma A.Ş. (Botaş) (Government)	Botas Marmara Ereglisi regasification terminal, Sultankoy, Tekirdag Province	6,500
Do.	do.	EgeGas LNG (Çolakoğlu Group, 100%)	Aliaga regasification terminal, Aliaga, Izmir Province	6,000
Magnesite		Kümaş Kütahya Manyezit Sanayi A.Ş. (Yildiz Holding and Gurmen Group, 90%)	Dead-burned magnesia plant in Kutahya, Kutahya Province	300
Do.		do.	Fused magnesia plant in Kutahya, Kutahya Province	40
Do.		Akdeniz Mineral Kaynakları A.Ş. (Grecian Magnesite S.A., 90%)	Caustic calcined magnesia plant in Eskisehir, Eskisehir Province	32
Do.		Konya Selçuklu Krom Magnezit Tuğla Sanayi A.Ş. (Grecian Magnesite S.A., 90%)	Caustic calcined magnesia plant in Selcuklu, Konya Province	40
Do.		Magnesit Anonim Şirketi (MAŞ) (RHI Group, 100%)	Dead-burned magnesia plant in Dutlucu, Eskisehir Province	265
Do.		Cihan Grubu	Dead-burned magnesia plant in Erzurum, Erzurum Province	60
Molybdenum	metric tons	Kuzey Ege Bakır İşletmeleri AŞ (Özdoğu İnşaat Tic. Ltd. Şti, 100%)	Tepeoba, Balikesir Province	2,500
Natural gas	million cubic meters	Türkiye Petrolleri Anonim Ortaklığı (TPAO)	Akcakoca offshore terminal, Duzce Province	730
Nitrogen, N content of ammonia		Istanbul Gübre Sanayii A.Ş. (IGSAŞ) (Yıldız Yatırım Holding A.Ş.)	Korfez, Kocaeli Province	326
Do.		Gemlik Gübre Sanayii A.Ş. [Türkiye Gübre Sanayii A.Ş. (TÜGSAŞ)]	Gemlik, Bursa Province	270
Perlite		Bergama Mining Construction Machinery Perlite Industry & Trade Inc. (Cullas Group)	Bergama plant, Izmir Province	120
Do.		do.	Konya plant, Konya Province	20
Petroleum				
Crude	thousand 42-gallon barrels per day	Türkiye Petrolleri Anonim Ortaklığı (TPAO)	Oilfields in Adiyaman and Batman Provinces	65
Refined products	do.	Türkiye Petrol Rafinerileri A. Ş. (Tüpras) (Enerji Yatirimlari A.S., 51%)	Izmir refinery, Aliaga, Izmir Province	255
Do.	do.	do.	Izmit refinery, Izmit, Kocaeli Province	255
Do.	do.	do.	Kirikkale refinery, Kirikkale, Kirikkale Province	116
Do.	do.	do.	Batman refinery, Batman, Batman Province	25
Do.	do.	Ersan Petrol Sanayii A.Ş (Sayer Group, 100%)	Narli refinery,[3] Narli, Kahramanmaras Province	2
Phosphate rock		Eti Bakır A.Ş. (Cengiz Holding, 100%)	Mazidagi, Mardin Province	550
Silver:				
Ore	metric tons	Eti Gümüş A.Ş. (Yıldızlar SSS Holding)	Gumuskoy, Kutahya Province	12,000
Metal	do.	Atasay Kuyumculuk Sanayi ve Ticaret A.S.	Refinery at Istanbul	NA
Do.	do.	İstanbul Altın Rafinerisi A.Ş.	do.	NA
Do.	do.	Nadir Metal Rafineri A.Ş.	do.	150
Soda ash		Alkim Alkali Kimya	Cayirhan Mine, Ankara Province	150
Do.		Eti Soda A.Ş. [Ciner Group, 74%, and Eti Maden İşletmeleri Genel Müdürlüğü (Government), 26%)]	Beypazari trona mine and soda ash plant, Beypazari, Ankara Province	1,000
Do.		Soda Sanayii A.Ş [Türkiye Şişe ve Cam Fabrikaları A.Ş. (ŞİŞECAM)]	Kazanli, Mersin Province	1,150

See footnotes at end of table.

TABLE 2—Continued
TURKEY: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Sulfur	Türkiye Petrol Rafinerileri A. Ş. (Tüpras) (Enerji Yatirimlari A.S., 51%)	Izmir refinery, Aliaga, Izmir Province	NA
Do.	do.	Izmit refinery, Izmit, Kocaeli Province	NA
Do.	do.	Kirikkale refinery, Kirikkale, Kirikkale Province	NA
Sulfuric acid	Bandırma Bor ve Asit Fabrikalari İşletme Müdürlüğü (Eti Maden İşletmeleri Genel Müdürlüğü) (Government)	Plant at Bandirma, Balikesir Province	240
Zinc concentrate, Zn content	Çanakkale Madencilik Limited Şti.	Koru Mine, Canakkale Province	5
Do.	Çayeli Bakir İşletmeleri A.Ş. (First Quantum Minerals Ltd., 100%)	Cayeli Mine, near Cayeli, Rize Province	52
Do.	Dedeman Madencilik Tic. ve San. A.Ş.	Delikkaya and Yesil Hisar Cadirkaya Mines, Kayseri Province	10
Do.	Eczacibasi Esan	Balya Mine, Balikesir Province	120
Do.	Elkin Maden Tic. ve San. A.Ş.	Mines in Hakkari Province	NA
Do.	Meskan Ölmez Madencilik Harfiyat İnşaat yol Yaprim Petrol Ürünleri İthalat İhracat Nakliye Taahüt San. ve Tic.	do.	20
Do.	RCR ve Seyitoğlu Madencilik İthalat İhracat Tic. ve San. A.Ş. (Red Crescent Resources Ltd. and the Seyitoğlu family)	Hakkari Mine	NA
Do.	Seyitoğlu Madencilik A.Ş.	Mines in Hakkari Province	NA
Do.	Silvermet Inc.	Iskenderun, Hatay Province	12

[e] Estimated. Do., do. Ditto. NA Not available.

[1] Includes subbituminous coal.

[2] Suspended operations in 2013.

[3] Suspended operations in 2011.

THE MINERAL INDUSTRY OF TURKMENISTAN

By Karine M. Renaud

Turkmenistan has more than 200 identified mineral deposits, including barite, celestine, copper, clays (such as bentonite and kaolin), coal, gypsum, lead, marble, potash, quartz sand, salt, sand and gravel, sulfur, and zinc. The country's most important mineral deposits, from an economic prospective, are its crude oil and natural gas deposits and bromine-iodine brines. Turkmenistan was ranked fourth (excluding U.S. production) in the world in iodine production and eighth (excluding U.S. production) in bromine production in 2014. Turkmenistan had the world's fourth-ranked proven natural gas reserves, after Iran, Qatar, and Russia, which were estimated to be 17.5 trillion cubic meters (BP p.l.c., 2015, p. 6). The country's proven crude oil reserves were estimated to be 600 million barrels (Mbbl) (BP p.l.c., 2015, p. 20). In 2014, the nonfuel minerals produced in Turkmenistan included bentonite clay, cement, gypsum, lime, and salt (Ministry of Nature Protection of Turkmenistan, 2012, p. 11; Infoabad, 2013; Schnebele, 2016a, b).

Minerals in the National Economy

In 2014, the nominal gross domestic product (GDP) increased by about 15% to $47.93 billion from $41.85 billion in 2013. Turkmenistan's real GDP increased by 10.3% in 2014 compared with 10.2% in 2013 owing to the increase in natural gas exports to China. In 2014, hydrocarbon production increased by 6.1%. Industrial production increased by 11.4% in 2014 compared with 7.3% in 2013 owing to the increase in the production of chemicals, construction materials, electric power, and hydrocarbons. The Government continued development of the nonhydrocarbon sectors by adopting in 2012 the National Socio-Economic Development Program of 2012–2016. The program included plans for modernization of the country's infrastructure and promotion of foreign direct investment (FDI), which would help to diversify the economy of Turkmenistan and to reduce the country's reliance on hydrocarbon resources (Asian Development Bank, 2014, p. 121; 2015, p. 132; European Commission, 2014, p. 2; International Monetary Fund, 2014, p. 5).

Most of the FDI in Turkmenistan was invested in the crude oil and natural gas sector. The FDI was directed toward the development of three onshore production-sharing agreements (PSAs)—the Nebitdag contractual territory, which was operated by Eni S.p.A of Italy (previously by Burren Energy Plc. of the United Kingdom); the Khazar project, which was a joint venture between the State Oil Company Turkmenneft and Mitro International of Austria; and the Bagtyarlyk Contractual Territory, which was operated by China National Petroleum Corp. (CNPC). Six additional PSAs were in effect for Caspian Sea offshore operations, including Block I, which was operated by Petroliam Nasional Berhad (Petronas) of Malaysia; Block II (Cheleken Contractual Territory), which was operated by Dragon Oil Plc. of the United Arab Emirates; Block III, which was operated by Buried Hill Serdar Ltd. of Cyprus; Blocks 11 and 12, which was a joint venture between Maersk Oil of Denmark and Wintershall Holding GmbH of Germany; Block 23, which was operated by Rheinisch-Westfälisches Elektrizitätswerk AG (RWE) of Germany; and Block 21, which was operated by ITERA Oil and Gas Company LLC of Russia (ITERA). Under the PSAs, the corporate entities were subject to a 20% profit tax and a 15% royalty; in addition, 70% of the workforce of the foreign-owned company had to be Turkmen citizens, and 20% of the social welfare tax of the local staff was to be paid by foreign investors and their subcontractors (U.S. Department of Commerce, 2014, p. 6; U.S. Department of State, 2014, p. 18).

Government Policies and Programs

On December 23, 2014, the Government issued an amended Law on Subsoil 2014 (formerly the Law on Subsoil 1992). According to the new law, the subsoil and its resources throughout Turkmenistan, including the Caspian Sea sector, are the property of the state and cannot be purchased or sold. The objectives of the amended Law on Subsoil 2014 include the following: (1) protection of the interest of Turkmenistan and its citizens, rights of subsoil users, and mineral resources; (2) establishment of legal guarantee; and (3) creation of favorable conditions for the economic growth of the country and for investors. The law also states that the companies that use subsoil areas should conduct complete and complex geologic exploration, efficiently use mineral resources, pay fees for the use of subsoil resources, and follow the environmental requirements to prevent contamination of the subsoil. All activities related to crude oil are controlled by the Hydrocarbon Resources Law. If a signed international agreement includes rules that differ from the Hydrocarbon Resource Law, then the rules of the international agreement would be applied (Food and Agriculture Organization of the United Nations, 2014, p. 1–48; AzerNews, 2015).

According to the amended Law on Subsoil 2014, the use and protection of mineral resources is overseen by the Cabinet of Ministers of Turkmenistan, Federal agencies, and local authorities. The Cabinet of Ministers also includes the State Commission on Mineral Resources. The licenses for exploration are issued for 6 years with the right to extend them for 2 years; the mining licenses are issued for 20 years with the right to extend them for 5 years, and the licenses for exploration and mining (combined) are issued for 25 years. The licenses with no expiration date are (1) the construction and exploitation of underground structures not related to mining minerals and (2) the construction and exploitation of underground structures for waste and crude oil and natural gas storage (Food and Agriculture Organization of the United Nations, 2014, p. 1–48; AzerNews, 2015).

To support Turkmenistan's economic development, the Government planned to increase trade with neighboring countries, to develop natural resources, and to construct necessary infrastructure. In March 2013, the Presidents of Afghanistan, Tajikistan, and Turkmenistan signed a memorandum of understanding for the construction of a 400-kilometer (km)-long railway that would connect all three countries. The new railway would start in eastern Turkmenistan in the Atamyrat District, run to Akina-Andkhoy, Afghanistan, continue to Shir Kahn, Afghanistan, and connect with the town of Payndzh in Tajikistan. The project was part of the Central Asia Regional Cooperation Program, which was financed by the Asian Development Bank. The cost of the project was estimated to be between $1.5 billion and $2 billion. The construction of the railway started on June 2, 2013, and the railway was expected to be completed in all three countries by 2015 (Economist, The, 2013; Safirova, 2013; Salimov, 2013; Sadykov, 2014).

In 2013, Turkmenistan, Afghanistan, Pakistan, and India (collectively known as TAPI) signed an agreement for the construction of a 1,680-km natural gas pipeline. The Asian Development Bank was assigned as an advisor for this project and was to work closely with the four countries (Turkmenistan, Afghanistan, Pakistan, and India) to attract foreign investors. The TAPI pipeline was expected to start operating by 2018 with the capacity to carry 90 million cubic meters per day of natural gas. Turkmenistan expected to sell 38 million cubic meters per day of natural gas to India and Pakistan (each), and Afghanistan would receive the remaining 14 million cubic meters per day of natural gas. In 2014, the Asian Development Bank contracted with the Penspen Engineering Group of the United Kingdom to conduct a feasibility study for the TAPI natural gas pipeline. Penspen's feasibility study would include the following: (1) revision of the proposed route, (2) confirmation of the compressor station size and location, and (3) estimation of the cost of project development and the schedule. The feasibility study was expected to take 6 months to complete (Hindu, The, 2012; Penspen, 2014; Press Trust of India, 2014).

Production

Detailed production data and other information regarding mineral production for most mineral commodities in Turkmenistan, except natural gas and petroleum, have not been available for a number of years. The State Committee on Statistics of Turkmenistan reported production rates of growth for most of the economic categories that it tracks, including those for construction materials, metals, mineral fertilizers, and mineral products. Production estimates in table 1 are based on past levels of production and on occasional published data reported by the mass media. In 2014, bentonite production increased by 11%; cement, by 9%; natural gas, by 11%; ammonia nitrogen, N content, by 3%; and rolled steel, by 1% (Safirova, 2013, p. 46.1; State Committee on Statistics of Turkmenistan, 2015, p. 2–3). Data on mineral production are in table 1.

Structure of the Mineral Industry

In 2007, the State Company Turkmenkhimiya, under the President of Turkmenistan, was formed by merging two joint-stock companies—Turkmendokun fertilizers and Turkmenyod. State-owned Turkmenkhimiya State Concern operated 10 facilities in Turkmenistan—the Balkanabat iodine plant, the Bereket iodine plant, Dokunkhimiya company, the Guvlyduz plant, IA Turkmenmineral, the Institute of Chemistry, the Khazar chemical plants, PO Garabogassulfat, PO Maryazot, and the Turkmenkarbamid plant. Turkmenkhimiya State Concern was responsible for the implementation of new technology in chemical facilities, the distribution of fertilizers and chemical products to the agricultural industries and the citizens of Turkmenistan, and the export of fertilizers and chemical products (Neft and Gas Turkmenistana, 2006a; TurkmenPortal, 2015).

Turkmenneft State Concern was a leading oil company in Turkmenistan. The company was responsible for the development of bentonite and oil production, the renovation of oil-extracting and mining industries, the exploration and exploitation of crude oil fields, and the export of bentonite and crude oil products. Turkmengas waz a leading natural gas company in Turkmenistan and was responsible for the development of natural gas and gas condensate fields, the drilling programs for eastern Turkmenistan, and the processing and transportation of natural gas, gas condensate, and liquid gas domestically and abroad (Neft and Gas Turkmenistana, 2006b, c; Gulf Oil and Gas, 2015). Table 2 is a list of major mineral industry facilities.

Mineral Trade

Turkmenistan's total trade value, including exports and imports, increased by 2.7% to $34.8 billion in 2014 from $33.9 billion (revised) in 2013, owing to an increase in gas exports to China. Total exports were valued at $19.6 billion, of which hydrocarbon exports accounted for $18.5 billion (94% of the total export value), and total imports were valued at $15.2 billion. Export commodities included cotton fiber, crude oil, gas, petrochemicals, and textiles. In 2013 (the latest year for which detailed data were available), Turkmenistan's main export partners were China (which received 66%, revised, of Turkmenistan's exports), the countries of the European Union (8%, revised), Turkey (5%), Afghanistan (3%, revised), the United Arab Emirates (3%), Iran (2%), and other countries (13%). Import commodities included chemicals, foodstuff, and machinery and equipment. In 2013 (the latest year for which detailed data were available), the main import partners were Turkey (which supplied 22%, revised, of Turkmenistan's imports), Russia (16%), the countries of the European Union (15%), China (13%), the United Arab Emirates (7%), Ukraine (4%, revised), Belarus (4%), and Iran, the United States, and Uzbekistan (3%, each) (International Monetary Fund, 2014, p. 5; European Commission, 2015, p. 9).

In 2014, imports from the United States to Turkmenistan were valued at about $455.5 million compared with $261.8 million in 2013; these included $2.1 million in finished metal shapes, $1.96 million in iron and steel products, $776,000 in nonmetallic minerals, $533,000 in petroleum products, $118,000 in iron and steel mill products, $116,000 in coal and fuels, $25,000 in aluminum and alumina, and $11,000 in copper (U.S. Census Bureau, 2014).

Commodity Review

Industrial Minerals

Bromine and Iodine.—The Government tasked Turkmenkhimiya State Concern with overseeing an increase in the production capacity of its chemical plants in the Balkan Welayaty, such as the Balkanabat iodine plant in Balkanabat City, the Bereket iodine plant in Gumdag City, and the Hazar chemical plant in Hazar City, by modernizing equipment at the plants. The modernization program was expected to last until 2030, by which time the production capacity at the Balkanabat iodine plant was expected to increase to 275 metric tons per year (t/yr) of iodine and 2,645 t/yr of bromine, and at the Hazar plant, to 330 t/yr of iodine and 4,960 t/yr of bromine (Regnum, 2012).

Cement.—In 2014, cement production in Turkmenistan increased by 9% to 2.9 million metric tons (Mt) from 2.65 Mt in 2013. Turkmenistan had four cement plants operating with a total production capacity of 4.65 million metric tons per year (Mt/yr). State-owned Turkmencement operated two cement plants—JSC Kelyatinskiy cement plant (formerly JSC Bezmeyinskiy cement plant) and JSC Baharlynskiy cement plant. Polimeks İnşaat Taahhüt ve San. Tic. A.Ş. of Turkey (Polimeks) operated the other two cement plants—Jebel in the Balkan Welayaty and Garlyk in Lebap Welayaty. The Garlyk cement plant in the Lebap Welayaty began operations in 2013 with a production capacity of 1.4 Mt/yr. The Garlyk plant produced portland cement, oil well cement, and sulfate-resistant cement, and it employed 800 people. Turkmenistan planned to build a new cement plant in the Lebap Welayaty with a designed capacity of 1 Mt/yr as the part of the National Socio-Economic Development Program of 2012–2016 (Global Cement 2013; Global Cement, 2014; Chumakin, 2015; Ussaev, 2015).

Nitrogen.—In 2014, the Government continued construction and improvement of the chemical plants. In 2014, production of nitrogen (N content of ammonia) increased by 3% to 293,000 metric tons (t) from 285,000 t in 2013. In 2011, Renaissance Heavy Industries (a subdivision of Renaissance Construction of Turkey), which was headquartered in St. Petersburg, Russia, was awarded the contract for the construction of a large-scale nitrogen-production complex in Mary City. Renaissance Heavy Industries worked in cooperation with Turkmenhimiya State Concern, Kawasaki Plant Ltd. of Japan, and Sojitz Corp. of China. The main construction work was completed in January 2014, and the pre-commissioning and commissioning work were in progress throughout 2014. The complex would use Turkmenistan's natural gas as feedstock to produce 463,000 t/yr of ammonia and 743,000 t/yr of urea (Chumakin, 2013; Renaissance Construction, 2014a; Renaissance Heavy Industry, 2014, p. 4).

In 2013, an agreement was signed between the GAP İnşaat Yatırım ve Dış Ticaret A.Ş. of Turkey, Mitsubishi Corp. of Japan, and Turkmenhimiya State Concern for the construction of a large chemical plant in the city of Garabogaz in the Balkan Welayaty, near the Caspian Sea. Mitsubishi Corp. in cooperation with GAP İnşaat Yatırım ve Dış Ticaret A.Ş. was expected to begin construction of the plant in the first half of 2015. The cost of the project was estimated to be $1.3 billion. The plant was expected to start operations in June 2018 with a production capacity of 730,000 t/yr of ammonia and about 1.3 Mt/yr of urea (AzerNews, 2013b, p. 6).

Potash.—Turkmenistan had three identified potash deposits—the Garlyk, the Karabil, and the Tubegatan. The total potash resources of the three deposits were estimated to be approximately 2.8 billion metric tons. In 2010, Turkmenhimiya signed an agreement with JSC Belgorkhimprom of Belarus for the construction of a new potash plant in the eastern Lebap Welayaty, Turkmenistan. The plant's production capacity was expected to be 1.4 Mt/yr of potash and could be increased to 4 Mt/yr. Construction of the plant was underway in 2014, and was expected to be completed in 2015. The cost of the project was estimated to be $1 billion (Free Library, The, 2014; Turkmenistan.ru, 2015).

Sulfur.—In 2013, the Government planned to construct a sulfuric acid plant in Turkmenabad, which would have a production capacity of 500,000 t/yr. In 2013, Renaissance Heavy Industries, in cooperation with a consortium consisting of Mitsui Engineering & Shipbuilding Co., Ltd. of Japan and Rönesan Türkmen Inşaat Sanayi ve Ticaret A.Ş. of Turkey, was awarded the construction contract. The cost of the project was estimated to be $200 million. The Japan Bank for International Cooperation agreed to finance the project, which was expected to be completed by 2016. The sulfuric acid produced would be used in fertilizer production (DKL Engineering, Inc, 2014; Hanafusa, 2014; Renaissance Construction, 2014a, b).

Mineral Fuels and Related Materials

Oil and Natural Gas.—In 2014, Turkmenistan remained a leading natural gas exporter among Caspian and Central Asian countries. Turkmenistan produced 69 billion cubic meters of natural gas, of which 41.6 billion cubic meters were exported by pipeline to China (61%), Russia (22%), Iran (16%), and Kazakhstan (1%). In October, OAO Gazprom of Russia announced that it would reduce natural gas imports from Turkmenistan by 11 billion cubic meters per year to 4 billion cubic meters per year in 2015 (Natural Gas Europe, 2014; Alexander's Gas and Oil Connections, 2015; BP p.l.c., 2015, p. 22, 29).

In 2014, the C line, which was constructed by CNPC, was commissioned with a capacity to transport of 25 billion cubic meters per year of natural gas. The line was expected to be fully operational at the end of 2015 with a transmission capacity of 55 billion cubic meters per year. The starting point of the C line was at Gedaim, on the Turkmen-Uzbek border; it goes through Uzbekistan and Kazakhstan and ends at the border town of Khorgos in the western Xinjiang Region where it links with China's domestic west-east pipeline (Platts, 2013).

In 2011, the CNCP and state-owned Turkmengaz agreed to increase natural gas shipments to China to 65 billion cubic meters per year through the D line by 2016. The D line was expected to run from Turkmenistan through Uzbekistan, Tajikistan, and Kyrgyzstan to China. The project was expected to be completed in 2016. The additional natural gas supply for the D line was expected to come from the Galkynysh (formerly Southern Yolotan-Osman) gasfield. The total reserves of the Galkynysh deposit, which is located in southern Yolotan District, were estimated to be between 13.1 trillion cubic meters and 21.2 trillion cubic meters. The development of Galkynysh started in 2009 when Petrofac Ltd. of Jersey (United Kingdom) was awarded a $3.4 billion contract for construction of a gas-treatment plant with a production capacity of 10 billion cubic meters per year of natural gas. The project would also include construction of infrastructure and pipelines with the capacity to transport 20 billion cubic meters per year. In September 2013, the President of China announced the completion of the first phase of construction and declared that the second phase of the project had been initiated (Gurt, 2013; Jafarova, 2013; Platts, 2013; 2014; RIA Novosti, 2013; Tiantian, 2013; Natural Gas Asia, 2014; White and Phua, 2014, p. 4).

Eni operated a project under a PSA with the State Agency for Management and Use of Hydrocarbon Resources (SAMUHR) for the Nebitdag Block—a 200-square-kilometer (km^2) area located in western Turkmenistan. Eni produced 3.0 Mbbl of crude oil from the project in 2014, mainly from the Burun oilfield. The crude oil was transported by pipeline to the refinery in Turkmenbashi. In 2014, Eni and SAMUHR signed an addendum to the original PSA. The new PSA, which extended the agreement to 2032, included new regulations regarding exploration and production activities at the onshore Nebitdag area, the transfer of 10% of Eni's 100% stake in the Nebitdag Block to the state-owned oil company Turkmenneft, and provisions for training of local staff in the crude oil and natural gas sector. Eni also signed a memorandum of understanding with the SAMUHR to evaluate Eni's activities in the Caspian Sea offshore Turkmenistan (Eni S.p.A., 2014, p. 39, 47).

In May 2013, a joint venture of Hyundai Engineering Ltd. and LG International Corp. of the Republic of Korea was awarded a contract for a large-scale energy construction project. The project included the construction of a natural gas plant with a total designed production capacity of 17 Mbbl of high-octane gasoline, modernization of Turkmenistan's state-owned oil refineries, and the modernization of two existing oil refineries—the Seidi oil refinery and the Turkmenbashi complex of oil refineries. The total cost of the project was estimated to be $4.8 billion. The refineries' modernization project included the design and construction of systems to remove sulfur from gasoline and diesel; the refineries were expected to use natural gas from the Caspian Sea shelf. The modernization project was expected to be completed in 2017, and the construction of the natural gas plant, by 2018 (AzerNews, 2013a; Hasanov, 2013b; Tandem Post, 2013; Brelsford, 2015; Yeon-jin, 2015).

In 2000, Dragon Oil Plc. of the United Arab Emirates was granted a 25-year contract under a PSA for the Cheleken area. The Cheleken contract area was estimated to be approximately 950 km^2. The area consisted of two offshore oil and gas fields—the Dzheitune (Lam) field and the Dzhygalybeg (Zhdanov) field, at a water depth between 8 and 42 meters. Dragon Oil drilled 14 development and appraisal wells, of which 13 were in the Dzheitune field and 1 in the Dzhygalybeg field. On December 31, 2014, Dragon Oil's proven and probable oil and condensate reserves were estimated to be 663 Mbbl and its oil and condensate contingent (or inferred) resources were estimated to be 93 Mbbl. The company's natural gas reserves were estimated to be 37 billion cubic meters, and its contingent (or inferred) gas resources were estimated to be 37 billion cubic meter. Dragon Oil employed 1,900 people on this project. As of 2014, Dragon Oil was at the final stage of awarding a contract for the construction of the gas treatment plant with a capacity of 3.57 billion cubic meters per year of natural gas in the Hazar area. The plant was expected to start production approximately in 2018 (Dragon Oil plc, 2014, p. 8, 10, 23).

In 2013, Rosneft of Russia acquired 100% of ITERA Oil and Gas Co. (ITERA), including a 49% share of the company from ITERA Holding Ltd. The cost of the acquisition was estimated to be $2.9 billion. In 2009, ITERA Oil and Gas Co. of Russia signed a PSA with the SAMUHR. Under the agreement, ITERA would be able to conduct surveys for the exploration and development of oil and gas fields within offshore Block 21 in the Caspian shelf. From 2009 through 2012, ITERA conducted a two-dimensional–four-component (2D–4C) and a three-dimensional–four-component (3D–4C) seismic survey, and processed and interpreted two-dimensional and three-dimensional data. In 2013, ITERA drilled the first exploration well on Block 21. ITERA was expected to employ Turkmen citizens, to provide training, and to construct social facilities eventually (Hasanov, 2013a; Karpukhin, 2013; Oil and Gas Journal, 2013; ITERA International Group of Companies, 2014).

Uranium.—In 2009, AXG Mining Ltd. of Australia acquired Mineral and Petroleum Products Ltd. of the British Virgin Islands, which owned mineral licenses for two areas—the Taurkyr (Kaplankyr-Taurkyr) license in the western Qarakum Desert in northwestern Turkmenistan and the Koytendag license in the east. The licensed areas covered approximately 22,000 km^2. In 2011, AXG Mining Ltd. closed its office in Turkmenistan (AXG Mining Ltd., 2009, p. 14; 2012, p. 14).

Taurkyr consists of three uranium deposits—Amanbulak, Novodgodneye, Sernoye—and one occurrence. Sernoye, which is a structurally controlled volcanic-type deposit, was discovered in 1952 and was mined by open pit and underground methods from 1952 to 1967. The mineralization, which is vein type, is 130 meters (m) long at the surface and 50 m wide. Uranium appears on the surface of a mineralized zone that is approximately 2 km long and 200 m wide and extends to a depth of 300 m (Dahlkamp, 2009).

Novodgodneye is a low-grade uranium deposit that grades between 0.01% and 0.1% uranium. The deposit was estimated to have an average grade of 0.03% uranium and to contain 2,000 to 2,500 t of uranium and 10,000 to 15,000 t of molybdenum (Dahlkamp, 2009, p. 397–398). The Amanbulak deposit, which is located 5 km southeast of Sernoye, has a grade of 0.12% uranium (maximum of 5% uranium) over a width of 13 m and a length of 35 m to 40 m. The Baïlik occurrence, which is located 10 km north-northwest of Sernoye, has two sectors of mineralization at depths of 130 m to 180 m. The northern sector was estimated to contain 5,000 t of uranium in weakly metamorphosed black and gray shales (Dahlkamp, 2009, p. 398–400).

Outlook

Turkmenistan is expected to continue to develop its hydrocarbon industry. The first phase of the development of the

Galkynysh gasfield has been completed, and it is likely to boost the country's natural gas production and exports. The Government also plans to develop the national oil-refining sectors because exporting refined petroleum products is usually more profitable than exporting crude oil. In 2014, Turkmenistan continued to focus on the development of the nonhydrocarbon sectors through the National Socio-Economic Development Program of 2012–2016. One sign of the emphasis on the nonhydrocarbon sectors is Turkmenistan's investment in chemical and construction material plants. The Government was planning to modernize the existing iodine and bromine plants and to construct new nitrogen- and potash-processing plants, and thus increase production in the nonhydrocarbon sectors (Chumakin, 2013; Safirova, 2013, p. 46.3).

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TABLE 1

TURKMENISTAN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1,2]

(Metric tons unless otherwise specified)

Commodity[3]		2010	2011	2012	2013	2014
METALS						
Steel, rolled		40,000	50,000	120,000	134,000	135,000
INDUSTRIAL MINERALS						
Bentonite		50,000	50,000	61,000	72,000	80,000
Bentonite powder		250	250	305 [r]	360 [r]	400
Bischofite		100	100	105	110	NA
Bromine		445	460	480	500 [r]	500
Cement[4]	thousand metric tons	1,150 [r]	1,950 [r]	2,370 [r]	2,650 [r]	2,900
Gypsum		100,000	100,000	105,000	105,000	107,000
Iodine		470	470	480	500 [r]	500
Lime		16,000	16,000	18,000	19,000	19,400
N content of ammonia[4]		270,000	270,000	280,000	285,000	293,000
N content of urea[4]		341,000	341,000	341,000	341,000	344,000
Salt		215,000	215,000	220,000	225,000	230,000
Sodium sulfate		60,000	60,000	62,000	63,000	68,000
Sulfur[4]		100,000 [r]	200,000 [r]	240,000 [r]	400,000 [r]	440,000
MINERAL FUELS AND RELATED MATERIALS						
Natural gas[4]	million cubic meters	42,400 [r]	59,500 [r]	62,300 [r]	62,600 [r]	69,000
Petroleum:						
Crude[4]	thousand 42-gallon barrels	78,120 [r]	78,120 [r]	79,920 [r]	83,160 [r]	86,040
Refinery products	do.	62,322 [4]	63,200	64,300	65,329 [r, 4]	66,800 [4]

[r] Revised. NA Not available.

[1] Estimated data are rounded to no more than three significant digits.

[2] Table includes data available through June 26, 2015.

[3] In addition to the commodities listed, barite, bench gravel, coal, dolomite, epsomite, and kaolin are thought to be produced, but available information is inadequate to make reliable estimates of output.

[4] Reported figure.

TABLE 2
TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits[2]	Location or deposit names	Annual capacity
Argillite cubic meters	Yashlykskii Keramzit plant	Yagmanskoye deposit, Balkan Welayaty	200,000
Barite-witherite	Arpaklenskiy mining enterprise	Arpaklen deposit	10,000
Do.	NA	Kumytash deposit and other deposits	NA
Bench gravel and loam:			
Bench gravel	Bezmeinskiy deposit	Near Ashgabat	1,200,000
Loam	do.	do.	12,000
Bischofite, epsomite, Caspian Sea salt, Glauber's salt	Karabogazsulfate Association	Kara-Bogaz-Gol Lagoon, off the Caspian Sea	NA
Bromine	Cheleken plant	Cheleken Peninsula	5,000
Do.	Nebitdag plant	Nebitdag, Balkan Welayaty	2,500
Cement	Bezmeinky cement plant (state-owned Turkmencement)	Bezmein	1,000,000
Do.	Kelete cement plant (state-owned Turkmencement)	70 kilometers west of Ashgabad	1,250,000
Do.	Jebel cement plant (Polimek Insaat Taahhüt ve San. Tic. A. Şh.)	Jebel, Balkanabat Nebitdag region	1,000,000
Do.	Garlyk cement plant (Polimek Insaat Taahhüt ve San. Tic. A. Şh.)	Lebap Welayaty, Turkmenabat region	1,400,000
Clays:			
Bentonite	Oglanly Mine	Oglanly region, Balkan Welayaty	100,000
Kaolin	Ashkhabad glass plant	Kyzylkainskoye deposit	80,000 [e]
Do.	Tuarkyrskoye deposit	250 kilometers southeast of Turkmenbashi	NA
Coal	do.	do.	NA
Dolomite	Ashkhabad glass plant	Kelyatinskoye deposit	6,000 [e]
Gypsum	IA Turkmenmineral	Mukry, Tagorin deposits	300,000
Do.	Wastes from Gaurdak sulfur deposit	Gaurdak, Gora	400,000
Do.	Krasnovodsk Aylagy (anhydride) deposit	9 kilometers east of Turkmenbashi	160,000
Iodine	Khazar chemical plant (SI Turkmenhimiya Holding)	Khazar, Balkan Welayaty	355
Do.	Balkanabatskiy iodine plant (SI Turkmenhimiya Holding)	Balkanabat, Balkan Welayaty	255 [e]
Do.	Bereketskiy iodine plant (SI Turkmenhimiya Holding)	Kumdag, Balkan Welayaty	NA
Limestone	Deposits:		
	Gaurdak	4 kilometers northeast of Gaurdak	NA
	Kara-Dzhumalakskoye	60 kilometers from Gaurdak	NA
Limestone, for facing materials	NA	Charshanginskoye, Gaurdakskoye, Geok-Tepinskoye, Kaylyu, Krasnovodsk Aylagy (tuff and granite), and Tyuzmergenskoye deposits	NA
Natural gas million cubic meters	Achakskoye, Dauletabad, Doviet-Denmez (Donmez), Gygyrlinskoye, Ioltan (South Yolotan-Osman), North and South Naipskiye, Shatlyk, and Yashlar deposits	Onshore in eastern and southwestern parts of the country and offshore in the Caspian Sea; Murgab basin; Dashoguzskiy, Lebapskiy, Maryyskiy deposits	90,000 [e]
Do. do.	China National Petroleum Corporation	Amu Darya Basin	5,000
Do. do.	Eni S.p.A.	Nebitdag Block	60
Ozokerite (hydrocarbon wax)	Cheleken mining enterprise	Cheleken Peninsula	NA
Petroleum:			
Crude thousand 42-gallon barrels	Barsa-Gelmesskoye, Burunskoye, Cheleken, Gograndagskoye, Ioltan (South Yolotan-Osman), Kamyshldzhinskoye, Korturtepinskoye, Kum Dag, Kuydzhikskoye, Okaremskoye, and Yashlar deposits	Centered in the Caspian plain in western Turkmenistan and in offshore oilfields to the west of the Cheleken Peninsula in the Caspian Sea	80,600 [e]

See footnotes at the end of table

TABLE 2—Continued
TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits[2]	Location or deposit names	Annual capacity
Petroleum—Continued:				
Crude—Continued	thousand 42-gallon barrels	Eni S.p.A.	Nebitdag Block	3,000
Do.	do.	Dragon Oil	Cheleken Basin	35,000
Petroleum:				
Refined	do.	Refineries: Seidi oil refinery Turkmenbashi complex of oil refineries	Of which: Lebap Welayaty Turkmenbashi	78,000 [3]
Do.		Karabil'skoye deposit	17 kilometers south of Gaurdak	NA
Quartz sand		Annauskoye, Babadurmazskoye, Bakhardenskoye, and Kelyatinskoye deposits	NA	NA
Rock salt		Gaurdak deposit	8 kilometers from Gaurdak	15,000 [e]
Do.		Khodzhaguymaskoye deposit	4 kilometers west of Gaurdak	NA
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	2,000 [e]
Do.		Uzun-Kudukskoye deposit	20 kilometers from Gaurdak	2,000 [e]
Salt		Kuulinskoye	40 kilometers north of Turkmenbashi	650,000 [e]
Salt, iodized		Guvludyz Salt Factory	Balkan Welayaty	60,000
Sand and gravel	cubic meters	Dushaksoye deposit	NA	1,150,000
Do.	do.	Kala-I-Morskoye deposit	NA	925,000
Do.	do.	Kernayskoye deposit	NA	36,000
Do.	do.	Kubatayskoye deposit	NA	740,000
Do.	do.	Ufrinskoye deposit	NA	900,000
Sodium sulfate		Karabogazsulfate Association	Bekdash, Kara-Bogaz-Gol Lagoon (off the Caspian Sea coast)	400,000
Steel, rolled		Turkmen metallurgical plant	Near Ashgabat	160,000
Do.		Shakhtaminskoye deposit	do.	NA
Do.		IA Turkmenmineral	Gora deposit	340,000
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	NA
Sulfur		China National Petroleum Corp., Petrofac Ltd., LG International Corp., Hyundai Engineering and Construction Corp. Ltd.	Three plants, Galkynysh	3,430,000

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[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2] The majority of companies are Government-owned.

[3] Capacity estimates are totals for all enterprises that produce that commodity.

THE MINERAL INDUSTRY OF UKRAINE

By Elena Safirova

Ukraine was among the world's leading producers of a number of minerals. It was one of the world's top four producers of gallium; the third-ranked producer of rutile (13.4% of world output, exclusive of U.S. production); the fifth-ranked producer of titanium sponge (3.7% of world output, exclusive of U.S. production); the seventh-ranked producer of iron ore (2.0% of world output) and manganese ore (2.4% of world output); and the ninth-ranked producer of steel (1.6% of world output), ilmenite (4.5% of world output), and pig iron (2.1% of world output). The country had significant coal and uranium resources but depended on imported petroleum and natural gas (Bedinger, 2016a, b; Corathers, 2016; Fenton, 2016; Jaskula, 2016; Tuck, 2016).

In 2014, several political developments in Ukraine affected the economy of the country, including its mineral industry. In late February, the President of Russia ordered the invasion of Ukraine's Crimea Peninsula, claiming that the action was needed to protect ethnic Russians living there. Two weeks later, in March, a referendum was held regarding the integration of Crimea into the Russian Federation. The referendum was not recognized by the Governments of Ukraine, the United States, the European Union countries, and the United Nations General Assembly. After the referendum, the Ukrainian Government asserted that Crimea continued to be a part of Ukraine. In addition, parts of eastern Ukraine did not recognize the new Ukrainian Government and formed their own separatist republics with their own administration. This action resulted in armed conflicts with the Ukrainian Government that continued throughout most of 2014. In September 2014, the representatives of Russia, Ukraine, and the separatist republics signed a cease-fire agreement, but the agreement largely failed to stop the fighting (U.S. Central Intelligence Agency, 2016).

Minerals in the National Economy

In 2014, Ukraine's real gross domestic product (GDP) decreased by 6.8% compared with that of 2013.[1] The nominal GDP in 2014 amounted to $130.8 billion.[2] During the year, overall annual industrial output was reduced by 10.1% compared with that of 2013; production of mining and quarrying decreased by 13.7%, of which coal and lignite production decreased by 30.5%, oil and gas extraction decreased by 1.7%, and mining of metal ores decreased by 6.6%. Production of the manufacturing sector decreased by 9.3%. Within the manufacturing sector, the manufacture of basic metals decreased by 14.7%; fabricated metal products, except machinery and equipment, decreased by 13.9%; coke and refined petroleum products decreased by 21.3%; chemicals and chemical products decreased by 14.2%; and cement, lime, and plaster decreased by 7.7% (State Statistics Service of Ukraine, 2015a, b).

The State Statistics Committee of Ukraine reported that the share of mining and quarrying in the country's GDP was 10.7% in 2014, and the share of manufacturing was 63.4%. The share of industrial production in the GDP was 25.5%. The share of metallurgical production in overall industrial production was 16.9%; the share of chemical and chemical products manufacturing was 3.5%; and the share of coke and refined petroleum manufacturing was 3.4% (State Statistics Service of Ukraine, 2015a, b).

Government Policies and Programs

In April 2014, the Verkhovnaya Rada (the Parliament) supported the bill proposed by the Government to increase royalty payments for coking coal, iron ore, natural gas, and petroleum. The new royalty rates were to be valid through the end of 2014 and to be reconsidered at yearend. For natural gas extraction, the rates varied by depth of extraction and by the use of the resource. For nonresidential use, the rate for a depth of extraction of less than 5 kilometers was increased to 55% from 28% and for a depth of extraction of more than 5 kilometers, to 28% from 15%. For residential use, the rates remained unchanged at 20% of the value for a depth of extraction of less than 5 kilometers and 14% of the value if the depth of extraction exceeded 5 kilometers (Delo.ua, 2014a).

The royalty rates for petroleum and gas condensate production extracted from depths of less than 5 kilometers were increased to 45% from 39% for petroleum and to 45% from 42% for gas condensate. The rates for petroleum and gas condensate extracted from depths of more than 5 kilometers were increased from 18% to 21%. Also, the Government changed the structure of payments for iron ore and coking coal mining. Prior to April 2014, iron ore producers paid 3.64 hryvnias ($0.30) per mined ton of ore. After the change, the producers would pay 5% of the value of the marketable product, which in this case was iron ore concentrate. As a result, the effective increase in the rental payment would be equivalent to about 3.5 times. The rate for coking coal extraction was increased to 1.5% of its value from 0.4% (Delo.ua, 2014a; Grechko, 2014).

The increases in royalty rates, in addition to the 1.5% military tax imposed on wages, were expected to increase the Government's tax collection. The increase in tax rates for oil and gas was expected to add 4.8 billion hryvnias (about $400 million) to Government revenues, and the military tax on wages would add 2.9 billion hryvnias (about $240 million). Some independent observers, however, expressed concerns about economic disincentives for the production of natural resources that might result from the rate increases (Delo.ua, 2014a).

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[1] The data in this report do not include the territory of the Autonomous Republic of Crimea, the city of Sevastopol, and parts of the zone of anti-terrorist operation.

[2] Where necessary, values have been converted from Ukrainian hryvnia (UAH) to U.S. dollars (US$) at an annual average exchange rate of UAH11.977=US$1.00 for 2014.

Production

Production of most mineral commodities decreased in 2014. The output of manganese metal decreased by 82%; salt, by 57%; sulfuric acid, by 53%; anthracite coal, by 47%; and nitrogen, by 43%. The output of several other mineral commodities also decreased significantly, including limestone, which decreased by 38%; zircon concentrate, by an estimated 34%; ilmenite concentrate, by an estimated 33%; rutile concentrate, by an estimated 32%; feldspar and marketable coal, by 29% each; and ferrosilicon, by 26%. On the other hand, output of kaolinitic clays increased by 46%; kaolin, by 21%; and ferromanganese and silicomanganese, by 16% each. These and other production data are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Mineral Trade

The total value of Ukraine's exports of goods and services decreased to about $64.1 billion in 2014 from $74.8 billion (revised) in 2013; exports of goods only decreased to $53.9 billion in 2014 from $62.3 billion (revised) in 2013. The value of total exports was equal to about 49% of Ukraine's GDP in 2014. Ukraine's leading export category in terms of value was ferrous metals, and in 2014, exports of ferrous metals were valued at $12.9 billion and made up 23.9% of the total value of all exports of goods; exports of cinder, ores, and slag were valued at $3.5 billion and made up 6.4% of the total value of commodity exports. Another $2.0 billion (3.7% of the total value of exports) was contributed by exports of mineral fuels and petroleum products. The value of exports of mineral products and metals made up about 39.6% of the value of total commodity exports. The main export partners of Ukraine were Russia (which received 18.2% of Ukraine's commodity exports); Turkey (6.6%); Egypt (5.3%); China (5.0%); Poland (4.9%); Italy (4.6%); and India (3.4%) (State Statistics Service of Ukraine, 2015c).

The total value of Ukraine's imports of goods and services was about $60.8 billion in 2014 and $83.3 billion (revised) in 2013. The total value of Ukraine's imports of goods only was $54.4 billion in 2014 and $75.8 billion (revised) in 2013. The leading imported commodities were mineral fuels and refined petroleum products, which made up about 27.8% of the value of total commodity imports in 2014. The country's main import partners in 2014 were Russia (which supplied 23.3% of Ukraine's imports); China and Germany (9.9% each); Belarus (7.3%); Poland (5.6%); and the United States (3.5%) (State Statistics Service of Ukraine, 2015c).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—The Nikolaevskiy alumina plant was the only producer of alumina in Ukraine and one of the leading nonferrous metal plants in Europe. The plant was owned by United Company RUSAL (RUSAL) of Russia and was the second leading alumina-producing facility owned by the company. In 2014, the plant produced 1,457,000 metric tons (t) of alumina, which was a 2.4% decrease compared with the 2013 output. In addition to alumina, the plant produced aluminum hydrate and gallium, which were both exported and sold domestically. In 2014, the plant paid 339.6 million hryvnias ($28.3 million) in various taxes. During the past 15 years, the plant invested tens of millions of hryvnias (millions of U.S. dollars) in the social programs of the Mikolayivskaya Oblast', and provided jobs for more than 2,000 contractors. According to the company's reports, in the past 5 years the plant reduced energy consumption by 20% without reducing the plant's output. In 2015, the company planned to increase alumina production to 1.7 million metric tons per year (Mt/yr) (Korrespondent.net, 2015).

Another RUSAL asset in Ukraine was being nationalized. In October 2014, the Supreme Economic Court of Ukraine decided to return 68% of the shares of the Zaporozhye Aluminum Complex (ZAlK) to the Government. The company stated that it planned to appeal. The reason for the decision was allegedly RUSAL's nonfulfillment of investment obligations. The October decision was the third court decision to return ZAlK to the Government. In 2010, RUSAL broke an agreement concerning the refinancing of an old $75.5 million debt that ZAlK incurred before RUSAL became its owner. In April 2011, RUSAL stopped production of primary aluminum at ZAlK; the decision was motivated by the cancellation of discounted electricity rates that ZAlK had access to previously. In March 2014, the Dnieprovskaya Environmental Public Prosecutor's Office was conducting an investigation related to air emissions from a thermal plant operated by ZAlK. According to the company, RUSAL had a complete set of relevant documents and permits to operate the thermal plant and was pursuing the matter in the courts (Ecoindustry.ru, 2014; United Company RUSAL, 2015).

As of the beginning of 2014, the only product produced at ZAlK was aluminum wire rods (an intermediate product, which is usually used for aluminum cable production). ZAlK had the capacity to produce 20,000 metric tons per year (t/yr) of wire rods. The company noted that production of wire rods was dependent on intermittent demand. In 2013, ZAlK produced 17,000 t of wire rods, but the demand in 2014 was significantly reduced. In August 2014, RUSAL announced that it had stopped producing wire rods at ZAlK because, during the past several years, the cost of producing wire rods at ZAlK had increased three times and was exceeding the cost of producing rods at other RUSAL plants. As a result, by the end of 2014, ZAlK did not produce any products. It was not clear, however, if the Government would be able to find investors who would be able to make ZAlK profitable (Metaltorg.ru, 2014a, b; Minprom.ua, 2014b).

Ferroalloys.—In 2014, according to the Ukrainian Association of Ferroalloys Producers, production increased by 24.7% to 1,088 Mt. In particular, the output of silicomanganese increased by 32.7% to 840,900 t and ferromanganese, by 23.2% to 103,000 t. The production of ferrosilicon decreased by 3.7% to 142,300 t, and the production of manganese metal was reduced by 81.9% to 1,300 t. In 2014, Ukraine increased imports of ferroalloys to 912,465 t, which was an increase of

3.3% compared with those of 2013. In particular, imports of ferrosilicon increased by 7.2% to 462,162 t. In 2014, exports of ferroalloys increased by 40.2% compared with the 977,500 t exported in 2013 and the revenue from their sales increased by 27.2% in 2014 compared with those of 2013 and amounted to $1.152 billion. Ferrosilicomanganese made up about 70% of total ferroalloys exports; exports increased by 46.7% to 684,500 t. The major export partners for ferroalloys from Ukraine were Turkey, which received 23.2% of all exports by weight, and Russia, 19.4%. The Netherlands increased imports of Ukraine's ferroalloys by about 40% in 2014 compared with those of 2013, and, as a result, received about 12% of all Ukraine's ferroalloys (Business.ua, 2015; Metalbulletin.ru, 2015; Ukrrudprom.com, 2015).

In 2014, Ukraine had four ferroalloys plants—the Kramatorskiy, the Nikopol'skiy, the Stakhanovskiy, and the Zaporozhskiy. The latter three plants were controlled by the Privat Group, and significant shares were owned by the EastOne Investment Group. The Nikopol'skiy ferroalloys plant was the largest of the three and produced a total of 669,400 t of ferroalloys in 2014. The Stakhanovskiy ferroalloys plant, which was located in Luhans'ka Oblast', produced 90,800 t of ferroalloys in the first 6 months of 2014, which was a 62% increase compared with the first 6 months of 2013. Between December 2012 and March 2013, the plant was not in operation, reportedly because of the high electricity rates that made its operation unprofitable. In May 2014, there were reports that the Stakhanovskiy ferroalloys plant had stopped operations because the energy supply to the plant was interrupted by a terrorist act. The energy supply was restored within a day and the plant continued operations between May and July 2014. In July, however, the plant stopped operations because of the continuing military actions in the area and did not restart operations in 2014 (Delo.ua, 2014b; Fixygen.ua, 2014; Unian.net, 2014).

In December 2013, the Cabinet of Ministers of Ukraine signed a memorandum of understanding (MOU) with the Nikopol'skiy, the Stakhanovskiy, and the Zaporozhskiy ferroalloys plants and with the Pobuzhskiy ferronickel complex. The MOU allowed the four plants to purchase electricity at discounted prices. Two of the plants—the Stakhanovskiy and the Zaporozhskiy—had received discounted prices in 2013. It was expected that the total discount for the four plants would amount to about 500 million hryvnias (about $42 million). In exchange for the discounts, the Government demanded that the plants modernize, refuse to buy supplies from and sell products to offshore companies, sell products domestically at the same price as exports, make on-time payments of salaries and taxes, and fulfill mandatory social obligations. The cost of the discount was expected to be covered by increasing electricity rates charged to other industrial consumers (Kommersant.ru, 2013; Podolyanets, 2014).

In December 2014, the Eurasian Economic Commission (EEC), which was an agency of the Eurasian Economic Union, began investigating a price-dumping case against the Ukrainian ferroalloys plants. The premise of the investigation was that the electricity discounts from the Government allowed the ferroalloys plants to export ferroalloys at prices that were lower than the plants' actual costs and would lead to uncompetitive practices. The particular case under consideration was the export price of ferrosilicomanganese to Russia. At yearend, the results of the investigation were not yet known (Vzglyad, 2015).

Gold.— Lugansk Gold Ltd., which was a subsidiary of Korab Resources of Australia, planned to invest a total of $50 million in a gold project at the Bobrikovskoye gold sulfide deposit in Luhans'ka Oblast'. In March 2013, the company started a prefeasibility study of the deposit and eventually planned to produce between 1,900 and 2,200 kilograms per year (60,000 and 70,000 troy ounces per year) of gold. The project included construction of a beneficiation plant that would have the capacity to process up to 500,000 t/yr of ore. The preliminary resources of the deposit were estimated to be 63.5 t. In August 2013, Korab updated the Joint Ore Reserves Committee (JORC) Code-compliant reserves of the deposit to 102.6 t of gold and 507 t of silver. The average gold grade of the deposit was 1 gram per metric ton (g/t), and that of silver, 9.4 g/t, and the minimal grades were 0.5 g/t and 5 g/t, respectively. The new resource evaluation was about a 60% increase compared with the previous evaluation, which was done in October 2012. In March 2014, Korab Resources was looking for a company to purchase mine output from the Bobrikovskoye Mine for further processing and extraction of gold. The company had already mined ore that contained about 930 kilograms (30,000 troy ounces) of gold with an average of 3 g/t gold, and about one-fourth of the ore contained 5 g/t gold; the mined ore was being stored at the company's facility adjacent to the Bobrikovskoye Mine. Korab Resources was also open to tolling arrangements for ore processing, especially in the application to ores with higher gold content. It was not known if the mined material had been processed by yearend (Mineral.ru, 2014).

Manganese.—As of 2014, Ukraine had two mining and metallurgical complexes (GOKs) involved in the production of manganese ore. Both complexes were owned by the Privat Group. The leading producer was PAO Ordzhonikidze GOK, which produced about 70% of the total output of manganese mined in the country. The Ordzhonikidze GOK mined manganese using an open pit method and produced manganese concentrates with manganese content of between 26% and 43%. As of 2014, the Ordzhonikidze GOK included seven open pit mines, two beneficiation plants, one beneficiation and agglomeration plant, and large transportation and auxiliary plants (Ubr.ua, 2016b).

PAO Marganetskiy GOK mined manganese using predominantly an underground method; 80% of manganese was mined from underground. The Marganetskiy GOK mined the eastern part of the Nikopolmarganets basin. The GOK included two open pit mines, seven underground mines, two beneficiation plants, and auxiliary services. The Marganetskiy GOK was involved in the mining and beneficiation of manganese ores, mining of bentonite, and the production of manganese sulfate dehydrate, in both metallic form and as a solution (Bin.ua, 2015; Ubr.ua, 2016a).

In 2014, the Ordzhonikidze GOK reduced production of manganese agglomerate by 4.2% to 287,000 t but increased production of manganese concentrate by 9.7% to 594,300 t, compared with production in 2013. The Marganetskiy GOK increased production of manganese concentrate by 46.8% to 647,600 t in 2014. According to the Ukrainian Federation of

Metallurgists, average monthly wages at the Ordzhonikidze GOK were 3,820 hryvnias (about $319), and those at the Marganetskiy GOK were 3,347 hryvnias (about $279), which was 21% and 31% lower, respectively, than average wages in the mining industry in Ukraine. Neither plant operated during the winter months and both had posted operating losses since at least 2010 (UAProm.info, 2014; Bin.ua, 2015).

Nickel.—The OOO Pobuzhskiy ferronickel complex (PFC) was the only enterprise in Ukraine that had the capacity to produce ferronickel from low-metal-content oxidized nickel ores. The complex was located in the village of Pobuzhskoye in Kirovohrad'ska Oblast' and employed about 35% of the village population. In 2003, the Solway Investment Group of Cyprus acquired PFC and started operations after a long period of inactivity. Since then, Solway had invested about $130 million in PFC and integrated the complex with other assets it owned, which were located in Guatemala, Indonesia, and Macedonia. The PFC relied on nickel ore imported from Guatemala and Indonesia. In 2014, PFC imported 1,144,579 t of nickel ore and concentrates worth $76.7 million, which was a 37.6% decrease by volume and a 41.4% decrease by value compared with output in 2013; 84.14% of the shipments, by value, were from Guatemala and the other 15.86% were from Indonesia. It was reported that PFC also tested a shipment of domestic ore in 2014 and suggested that the supplier finalize the properties suitable for the long-term supply of ore (Interfax.ua, 2016; UKRFA.com, 2016).

In 2014, PFC reduced its production of ferronickel by 6.1% to 114,222 t (gross weight) compared with 2013 production. PFC stated that the main reason for the decrease was a limited supply of electricity. In 2014, PFC earned profits of 12.2 million hryvnias (about $1 million). PFC paid more than 45 million hryvnias (about $3.75 million) of unified social taxes and about 14 million hryvnias (about $1.17 million) in labor taxes. The company also invested 214,000 hryvnias (about $17,880) in the education of its workers. The average monthly wages of PFC employees were 4,000 hryvnias (about $330), which was reportedly 24% higher than the average wage rate in the country (Semenov, 2014; Finance.ua, 2015).

In 2012–13, a significant portion of PFC's operations were switched from natural gas to coal powder. As a result, PFC's use of natural gas was reduced from 85 million cubic meters in 2013 to 13 million cubic meters in the first 8 months of 2014. In 2013–14, the company invested more than $15 million in energy efficiency and had three major investment projects at various stages of completion, including setting up a coal powder installation for ore drying, installing new emissions equipment, and improving the process of magnetic separation (Semenov, 2014).

Mineral Fuels and Related Materials

Uranium.—In 2014, Ukraine reduced its production of uranium ore by 3.2% to 957,488 t from 988,757 t in 2013. Uranium ore was mined in Ukraine from underground mines by the state-owned company Vostochnyi GOK, and it was processed into concentrate at the company's hydrometallurgical plant at Zheltye Vody. In 2014, uranium was mined at three mines—the Ingulskaya, the Novokonstantinovskaya, and the Smolinskaya. The concentrate was then sent to Russia to be processed by OAO TVEL of Russia into nuclear fuel for use in Ukraine; the remaining nuclear fuel required for Ukraine's nuclear powerplants was purchased from TVEL. Domestic uranium provided about 30% of the total nuclear fuel needed for Ukraine's powerplants. Ukraine imported nuclear fuel for its four nuclear powerplants—the Khmelnitskaya, the Rovenskaya, the YuzhnoUkrainskaya, and the Zaporozhskaya—from the Czech Republic, Russia, and Sweden. The powerplants had a total of 15 nuclear reactors and a combined design capacity of 13,900 megawatts (MW). In the country's energy balance, nuclear energy had a share of about 20%, but nuclear powerplants produced almost 50% of the country's electricity (Gazeta.ru, 2014; Tyurin, 2014; Unian.net, 2015).

As of 2014, Ukraine had a total of 12 uranium deposits with total resources of between 135,000 and 200,000 t of contained uranium, according to various estimates. About 10 other deposits were considered to be "potentially promising." Ukraine needed between 2,500 and 3,000 t/yr of uranium to provide enough fuel for its powerplants. The country, however, did not have the facilities to produce nuclear fuel and was dependent on Russia and other countries for such services (Gazeta.ru, 2014; Tyurin, 2014).

In April 2014, Areva S.A of France expressed its interest in creating a joint venture to develop uranium mines in Ukraine. Areva contacted and visited the Nuclear Fuel State Concern, which was the parent organization of the Vostochnyi GOK. Areva was particularly interested in uranium production using underground in situ leaching, in which it had substantial experience at the Safonovskoye deposit in Mykolaiyvska Oblast'. The identified resources of the deposit were estimated to be 17 million metric tons. In 2011, Areva had expressed interest in creating a joint venture to produce zirconium in Ukraine, but the negotiations did not result in any projects (Economicheskaya Pravda, 2014; MinerJob.ru, 2014; Minprom.ua, 2014a).

Outlook

Ukraine's mining and metallurgy sectors had significant setbacks during the past few years. Ukrainian aluminum production stopped, and it was not clear if another owner could make production profitable; ferroalloys plants required inexpensive electricity, and coal mines and petroleum refineries were outdated and required significant investments to become competitive.

Ukraine is likely to remain one of the leading world producers of manganese ore, titanium ores, and titanium sponge. Remaining competitive in metallurgy may prove to be difficult because of high energy requirements, the need for new investments, and the often differing interests of plant owners and the Government. It remains to be seen if the Government and the owners of privately owned industrial facilities will be able to reach compromises and if the country will be able to attract new investments to move the mineral and metallurgical industries of the country forward.

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TABLE 1
UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]	2010	2011	2012	2013	2014
METALS					
Alumina	1,534,000	1,601,000	1,429,000	1,493,500	1,457,000
Aluminum:					
Primary	25,000	24,830	14,829	--	--
Secondary[e]	130,000	130,000	90,000	25,000	--
Total[e]	155,000	155,000	105,000	25,000	--
Copper, metal, secondary[e]	20,000	20,000	15,000	15,000	12,000
Gallium[e]	13	13	11	13 [r]	13
Germanium[e] kilograms	700	700	700	700	600
Iron and steel:					
Iron ore, marketable ore and concentrate:					
Gross weight	78,170,700	80,580,800	81,966,400	70,389,000 [r]	68,337,000
Fe content[e]	43,000,000	44,300,000	45,100,000	38,700,000 [r]	37,600,000
Metal:					
Pig iron	27,361,000	28,881,100	28,484,000	29,089,000	24,801,000
Ferroalloys, electric furnace:					
Ferromanganese	280,100	180,500	163,921	88,626	103,000
Ferronickel:[e]					
Gross weight	62,000	62,000	119,652 [3]	121,586 [3]	114,222 [3]
Ni content	12,400	12,400	23,900	24,300	20,230 [3]
Ferrosilicon	195,500	150,900	150,265	191,207	142,300
Silicomanganese	940,400	843,500	823,131	724,892	840,900
Other	28,500 [e]	28,500 [e]	22,115	15,908	15,326
Total[e]	1,510,000	1,270,000	1,279,084 [3]	1,142,219 [3]	1,215,748 [3]
Steel:					
Crude	33,559,000	35,332,000	33,511,000 [r]	33,199,000	27,373,000
Finished products:					
Rolled	17,549,300	19,511,000	18,457,300	17,782,764	14,350,000
Pipe	1,928,400	2,371,800	2,014,000	1,812,980	1,560,000
Lead, refined, secondary[e]	7,000	13,500	13,700	13,500	13,000
Magnesium metal[e]	2,000	2,000	--	--	--
Manganese, marketable ore and concentrate:					
Gross weight	1,589,300 [4]	971,500	1,234,007	1,524,696	1,526,218
Mn content[e]	540,000	330,000	396,000	515,000	519,000
Manganese, metal	16,137	16,100 [e]	14,575	7,200	1,300
Titanium:[e]					
Ilmenite concentrate:					
Gross weight	500,000	260,700 [3]	246,800 [3]	670,000 [e]	450,000
TiO_2 content	295,000	153,800 [3]	145,640 [3]	295,000	200,000
Rutile concentrate, 95% TiO_2	60,000	60,000	58,000	162,000	110,000
Metal, sponge	7,400	9,000	10,300	9,400	7,200 [3]
Zirconium, zircon concentrate[e]	30,000	26,000	20,000	41,000 [3]	27,000
INDUSTRIAL MINERALS					
Bromine[e]	4,100	4,100	4,100	4,100	--
Cement, hydraulic	9,456,500	10,515,300	9,843,000	9,857,000	8,636,000

See footnotes at end of table.

TABLE 1—Continued
UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014
INDUSTRIAL MINERALS—Continued						
Clays:						
Bentonite[e]		185,000	211,000	219,000 [3]	220,000	210,000
Kaolin	thousand metric tons	1,085	1,317	1,218	1,179 [r]	1,426
Kaolinitic clays	do.	306	575	580	855 [r]	1,248
Feldspar		146,000	179,000	146,000	134,000	95,000
Graphite[e]		6,000	6,000	5,800	5,500	5,000
Gypsum		679,000	676,000	436,200	430,000 [e]	425,000 [e]
Lime	thousand metric tons	4,220	4,487	4,415	3,892	3,107
Limestone	do.	20,600	22,800	20,582	18,652	11,564
Nitrogen, N content of ammonia[e]	do.	3,400	4,300	4,160	4,237 [3]	2,400
Salt		4,908,000	5,938,000	6,189,446	5,796,000	2,498,000
Soda ash		706,700	700,000 [e]	720,000	720,000 [e]	600,000 [e]
Sulfuric acid	thousand metric tons	1,296	1,537	1,371	1,172 [r]	554
Sulfur, native[e]		130,000	130,000	120,000	120,000	100,000
Vermiculite[e]		60,000	60,000	60,000	60,000	50,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, raw:[e]						
Anthracite	thousand metric tons	14,000	14,059 [3]	20,763 [3]	15,604 [r, 3]	8,338 [3]
Bituminous	do.	61,000	67,600 [3]	64,690 [3]	27,953 [r, 3]	23,563 [3]
Lignite	do.	5,000	5,000	5,000	5,782 [r, 3]	5,000
Total	do.	80,000	86,700	90,500	49,339 [r, 3]	36,900
Marketable	do.	54,444 [3]	62,700 [3]	66,700	63,600	45,230 [3]
Coke		18,599,700	19,599,100	18,939,100	17,569,000	13,858,000
Natural gas[5]	thousand cubic meters	20,458,000	19,934,900	20,492,000 [r]	21,313,000	20,100,000
Peat:						
Fuel use		321,000	301,000	446,000	467,000	457,000
Horticultural use		138,000	129,000	210,000	131,000	119,000
Total		459,000	430,000	656,000	598,000	576,000
Petroleum:						
Crude and gas condensate[6]	42-gallon barrels	25,400,000	24,000,000	24,342,000	22,348,000	19,776,000
Refinery products[7]	do.	80,300,000	69,000,000	33,766,000	27,303,000	21,980,000
Uranium, mine output:[e]						
U content		850	890	960	922 [3]	892 [3]
U_3O_8 content		1,000	1,050	1,130	1,080 [3]	1,045 [3]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through February 1, 2016.

[2] In addition to the commodities listed, other mineral commodities may have been produced, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Includes secondary production.

[5] The data series for natural gas production is based on natural gas production as reported by the State Statistics Service of Ukraine and includes associated petroleum gas production.

[6] Figures were converted to barrels from metric tons, which were reported as follows: 2010—3,493,400; 2011—3,297,800; 2012—3,345,000; 2013—3,071,000 and 2014—2,739,000.

[7] Figures were converted to barrels from metric tons, which were reported as follows: 2010—10,333,000; 2011—8,787,000; 2012—4,300,000; 2013—3,477,000; and 2014—2,800,000,

TABLE 2
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Alumina and aluminum:			
Alumina	Nikolaevskiy alumina refinery [United Company RUSAL (RUSAL)]	20 kilometers south of Mykolaiv	1,601,000
Aluminum, primary	Zaporozhye smelter [United Company RUSAL (RUSAL)]	do.	114,000
Coal	About 150 active surface and underground mines, including:	About 95% of coal produced in Donets'ka, Dnipropetrovs'ka, and Luhans'ka Oblasts'	90,000,000 [3]
	Donbass Fuel and Energy Co. (DTEK) (System Capital Management, 100%):		
	DTEK Pavlogradugol	10 mines in Dnipropetrovs'ka and Donets'ka Oblasts'	
	DTEK Komsomolets Donbassa Mine	Kirovskoe, Donets'ka Oblast'	
	DTEK Dobropolyeugol	5 mines near Dobropillya, Donets'ka Oblast'	
	DTEK Sverdlovanthracite	5 coal mines and 3 processing plants in Luhans'ka Oblast'	
	DTEK Rovenkyanthracite	6 mines and 3 processing plants in Luhans'ka Oblast'	
	Krasnoarmeiskaya-Zapadnaya No. 1	1 mine at Krasnoarmeisk, Donets'ka Oblast'	
	JSC Krasnodon Coal Co. (Metinvest B.V.)	7 mines and 2 processing plants in Luhans'ka Oblast'	
	Smaller producers	Donets'ka, Dnipropetrovs'ka, Luhans'ka, Lvivs'ka, and Volyns'ka Oblasts'	
Coke	Evraz Group:	Dnipropetrovs'ka Oblast':	3,000,000
	OAO Dneprkoks coke plant	Dnipropetrovsk	
	OAO Bagliykoks coke plant	Dniprodzerzhinsk	
	OAO Dneprodzerzhinsk coke plant	do.	
Do.	Metinvest B.V.:		
	JSC Avdiivka coke plant	Avdeyevka, Donets'ka Oblast'	4,000,000
Do.	JSC Azovstal Iron and Steel Works	Mariupol, Donets'ka Oblast'	3,182,000
Do.	OJSC ArcelorMittal Kryviy Rih	Kryviy Rih, Dnipropetrovs'ka Oblast'	3,300,000
Do.	JSC Donetskkoks (Metinvest B.V., 24.5%, and OJSC Ilyich Iron and Steel Works, 12.96%)	Donetsk, Donets'ka Oblast'	390,000
Do.	Yenakievo coke plant	Yenakievo, Donets'ka Oblast'	NA
Do.	OAO Zaporozhkoks (JSC Zaporizhstal, 42%, and Metinvest B.V., 25%)	Zaporizhia	NA
Do.	Makeevka coke plant	Makeevka, Donets'ka Oblast'	NA
Do.	OAO Yasinovskiy coke plant	do.	NA
Do.	OAO Alchevsk coke plant [Industrial Union of Donbass (ISD Corp.)]	Alchevsk, Luhans'ka Oblast'	3,700,000
Do.	Horlivka coke plant	Horlivka, Donets'ka Oblast'	440,000
Do.	Kharkov coke plant	Kharkiv	225,000
Ferroalloys:			
Ferromanganese	Zaporozhskiy ferroalloys plant (PrivatBank Group)	Zaporizhia	100,000
Do.	Nikopol'skiy ferroalloys plant (PrivatBank Group and EastOne Group)	Nikopol	700,000
Do.	Stakhanovskiy ferroalloys plant (PrivatBank Group)	Luhans'ka Oblast'	NA

See footnotes at end of table.

TABLE 2—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Ferroalloys—Continued:			
Ferromanganese, blast furnace	Konstantinovka Iron and Steel Works	Konstyantynivka, Donets'ka Oblast'	NA [4]
Do.	Kramatorskiy ferroalloys plant	Kramatorsk, Donets'ka Oblast'	NA
Ferronickel	Pobuzhskiy ferronickel plant	Pobuzhye, Kirovohrads'ka Oblast'	100,000
Ferrosilicon	Stakhanov ferroalloys plant (PrivatBank Group)	Luhans'ka Oblast'	120,000
Do.	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	100,000
Silicomanganese	Stakhanov ferroalloys plant (PrivatBank Group)	Luhans'ka Oblast'	50,000
Do.	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	250,000
Do.	Nikopol ferroalloys plant (PrivatBank Group and EastOne Group)	Nikopol	900,000
Gallium	Nikolaev alumina refinery [United Company RUSAL (RUSAL)]	20 kilometers south of Mykolaiv	13
Germanium	Zaporozhye titanium-magnesium plant	Zaporizhia	19,000
Graphite	Zavalyevskiy graphite complex	Zavalyevskiy deposit	NA
Iron ore:			
Underground mining	Krivorozhskiy Iron Ore Complex (Metinvest B.V., 50%, and PrivatBank Group, 50%)	4 mines in Kryvorizkiy iron ore basin	7,000,000
Do.	Sukha Balka (Evraz Group)	2 mines in Dnipropetrovs'ka Oblast'	3,100,000
Do.	PJSC ArcelorMittal Kryviy Rih	2 mines at Kryviy Rih	1,500,000
Do.	Zaporozhye Iron Ore Complex	Eksplutatsionnay Mine in Zaporiz'ka Oblast'	4,500,000
Do.	JSC Central Iron Ore Enrichment Works (Metinvest B.V.)	1 mine in Dnipropetrovs'ka Oblast'	2,200,000
Open pit mining	do.	3 mines in Dnipropetrovs'ka Oblast'	12,000,000
Do.	JSC Northern Iron Ore Enrichment Works (Metinvest B.V.)	2 mines in Dnipropetrovs'ka Oblast'	30,000,000
Do.	JSC Ingulets Iron Ore Enrichment Works (Metinvest B.V.)	Ingulets Mine south of Kryviy Rih	35,000,000
Do.	Yuzhniy GOK (Evraz Holding, 50%, and Smart Holding, 50%)	Mine at Kryviy Rih	22,000,000
Do.	PJSC ArcelorMittal Kryviy Rih	2 mines at Kryviy Rih	26,550,000
Do.	Poltava GOK (Ferrexpo Plc.)	Gorishne-Plavninskoye and Lavrikovskoye (GPL) Mine 15 kilometers east of Kremenchug	30,000,000
Lead, secondary	CJSC Svinets	Kostyantynivka	20,000
Magnesium metal	Magnii concern	Kalush	22,000
Manganese:			
Ore, marketable	Ordzhonikidzevskiy GOK (PrivatBank Group)	Ordzhonikidze	700,000
Do.	PAO Marganetskiy GOK (PrivatBank Group)	Marhanets	NA
Metal	Zaporozhskiy ferroalloys plant (PrivatBank Group)	Zaporizhia	NA
Mercury	OOO Nikitrtyt	Horlivka, Donets'ka Oblast'	300
Natural gas	Yuzovskoye deposit (Royal Dutch Shell plc)	Kharkiv and Donets'ka Oblasts'	NA
Do.	Olesskoye deposit (Chevron Corp.)	Lvivs'ka and Ivano-Frankovs'ka Oblasts'	NA
Nickel, Ni content in ferronickel	Pobuzhskiy GOK (comprises three open pit mines and the Pobuzhskiy ferronickel plant)	Pobuzhye, Kirovohrads'ka Oblast'	20,000
Petroleum, refined 42-gallon barrels	Kherson oil refining plant	Kherson	NA
Do. do.	Odessa refinery (OAO Lukoil)	Odessa	23,000,000 [5]
Do. do.	Lisichansk refinery (TNK-BP)	Lisichansk	62,000,000
Do. do.	Halychyna refinery (Ukraine Oil Co.)	Drohobych, Lvivs'ka Oblast'	28,600,000
Do. do.	Kremenchug refinery (CJSC Ukrtatnafta)	Kremenchug	150,000,000
Do. do.	JSC Naftokhimik Prykarpattya	Nadvirna, Ivano-Frankivs'ka Oblast'	18,400,000
Do. do.	Shebelinka refinery	Shebelinka, Kharkivs'ka Oblast'	NA
Steel, crude	Industrial Union of Donbass Corp. (ISD Corp.):		
	OJSC Alchevsk Iron and Steel Works	Alchevsk, Luhans'ka Oblast'	5,200,000
Do.	Dneprovskiy Metallurgical Plant "Dzerzhinsky"	Dniprodzerzhinsk	3,850,000

See footnotes at end of table.

TABLE 2—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Steel, crude—Continued		OJSC ArcelorMittal Kryviy Rih	Kryviy Rih, Dnipropetrovs'ka Oblast'	7,400,000
Do.		Metinvest B.V.:		
		JSC Azovstal Iron and Steel Works	Mariupol, Donets'ka Oblast'	6,200,000
Do.		JSC Yenakiieve Iron and Steel Works	Yenakievo, Donets'ka Oblast'	2,700,000
Do.		OJSC Ilyich Iron and Steel Works	Mariupol, Donets'ka Oblast'	6,000,000
Do.		Dnepropetrovsk Metals Plant "Petrovskovo" (DMZP) (Evraz Group S.A., 96.77%)	Dnipropetrovsk	1,360,000
Do.		JSC Zaporizhstal (Metinvest B.V., 24.9%) (Mechel OAO)[6]	Zaporizhia	4,350,000
Do.		Kramatorskiy Metal Plant "Kuibiysheva"	Kramatorsk, Donets'ka Oblast'	NA
Do.		Donetskstal	Donetsk	NA
Do.		Donetsk electrometallurgical plant	do.	1,000,000 [6]
Do.		Dneprospetsstal	Zaporizhia	918,000
Do.		OOO Elektrostal	Kurakhovo, Donets'ka Oblast'	NA
Do.		JSC Energomashspetsstal (OJSC Atomenergomash)	Kramatorsk, Donets'ka Oblast'	NA
Do.		PJSC Azovelectrostal (JSC Azovmash)	Mariupol, Donets'ka Oblast'	500,000
Titanium:				
Concentrate:				
Ilmenite		Irshansk GOK [Leased from the Government by Crimea Titan CJSC (Government, 50% plus one share, and OstChem GmbH, 50% minus one share)]	Irshansk, 50 kilometers north of Zhytomyr	400
Do.		OOO Valki-Ilmenit (OstChem GmbH, 75%)	do.	70
Do.		Mezhdurechensk GOK (OstChem GmbH, 75%)	Zhytomyrs'ka Oblast'	84
Do.		Velta LLC	Korobchino, Novomirgorod district, Kirovograds'ka Oblast'	185 [7]
Do.		Volnogorsk state mining-metals complex [Leased from the Government by Crimea Titan CJSC (Ukraine Government, 50% plus one share, and OstChem GmbH, 50% minus one share)]	Volnogorsk, 70 kilometers west of Dnipropetrovsk	200
Do.		Demurinskiy GOK (Limpeza Ltd. of Cyprus 25%, and VSMPO-Avisma of Russia, 75%)	Dnipropetrovs'ka Oblast'	NA
Rutile		do.	do.	65
Sponge		Zaporozhye Titanium & Magnesium Complex (ZTMK) (Government, 51%, and Tolexis Trading Ltd., 49%)	Zaporizhia	NA
Ingots		OOO Antares	Kyev	NA
Do.		OOO Fico	do.	NA
Do.		Zaporozhye Titanium & Magnesium Complex (ZTMK) (Government, 51%, and Tolexis Trading Ltd., 49%)	Zaporizhia	NA
Titanium dioxide pigment		Crimea Titan CJSC	Crimea	NA
Do.		OAO Sumykhimprom	Sumy	NA
Uranium:				
Ore	thousand metric tons	Vostochnyi GOK (Government)	Ingulskaya Mine at Kirovohrad	450
Do.	do.	do.	Smolinskaya Mine at Smolino	600
Do.	do.	do.	Novokonstantinovskoye deposit in Kirovohrads'ka Oblast'	100
Concentrate		do.	Hydrometallurgical concentration plant at Zheltye Vody	1,000
Zinc, secondary		Ukrzinc plant	Kostyantynivka	25,000
Do.		CJSC Svinets	do.	30,000

See footnotes at end of table.

TABLE 2—Continued
UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1, 2]	Location or deposit names	Annual capacity[e]
Zirconium:			
Zircon concentrate	Volnogorsk state mining-metals complex [Leased from the Government by Crimea Titan CJSC (Ukraine Government, 50% plus one share, and OstChem Gmbh, 50% minus one share)]	Volnogorsk, 70 kilometers west of Dnipropetrovsk	35
Metal and compounds	State Research and Production Enterprise "Zirconium"	Dniprodzerzhinsk	NA

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Inconsistencies in enterprise and location names may appear in this table because both Ukrainian and Russian spellings were used for transliterations. English versions of company names are used as given by official company sources (Web sites, press releases, and so forth). Ukrainian versions of location names are used wherever possible.

[2] GOK is the abbreviation for gorno-obogotitelniy kombinat, which translates as "mining and beneficiation complex."

[3] Capacity estimates are totals for all enterprises that produce that commodity.

[4] Konstantinovka Iron and Steel Works stopped production of blast furnace ferromanganese in 2008.

[5] The Odessa refinery stopped production in the fourth quarter of 2010. Production could restart in the future if business conditions improve.

[6] In December 2011, Mechel OAO of Russia purchased 100% of the shares of the Donetsk electrometallurgical plant.

[7] Velta LLC began production of ilmenite concentrate in December 2011, but its first deliveries of commercial concentrate were not made until April 2012.

THE MINERAL INDUSTRY OF THE UNITED KINGDOM

By John R. Matzko

In 2014, the United Kingdom's gross domestic product (GDP) in current U.S. dollars was $2.95 trillion. In real terms, the GDP increased by 3.0% compared with that of 2013, and was projected to increase by 2.5% in 2015. The United Kingdom's economy was the 3d largest in Europe after Germany and France in terms of GDP based on purchasing power parity and 11th in the world. The services sector composed nearly 80% of the United Kingdom's GDP; the industrial sector, nearly 20%; and the agricultural sector, less than 1%. The country's industrial base was composed of companies that provided automotive, aviation, and railroad products, shipbuilding, chemicals, and machine tools. These industries relied on many imported metal ores, concentrates, refined metals, and industrial minerals. The United Kingdom has large resources of coal, natural gas, and petroleum, but oil and gas production has been declining and, since 2005, the United Kingdom has been a net importer of energy (International Monetary Fund, 2015; U.S. Central Intelligence Agency, 2015).

In 2012 (the latest year for which data were available), the country accounted for about 1.9% of the world's refined nickel production (including nickel content of chemicals). In 2014, the United Kingdom produced 2.5% of the world's crude salt output and 1.6% of the world's potash output (Bolen, 2016; Jasinski, 2016; Kuck, 2015, p. 51.24).

Minerals in the National Economy

The United Kingdom's mining and processing companies played an important role in global mineral prospecting, mineral development and production, and mineral commodity trade. By 2014, production of metal ores in the United Kingdom has mostly ceased; the processing of metals, however, was still important for the United Kingdom's exports and its industrial sector. London is home to the London Metal Exchange, which remained the world's leading central market for nonferrous metals, and it is also an international hub for the headquarters of major mining and mineral processing companies in the world, although many of these companies do not have production facilities in the country. The United Kingdom was a producer of various industrial minerals, and it was also a significant producer of crude oil, gas, and refinery products (Perez, 2016, p. 48.1).

Government Policies and Programs

The 1971 Minerals Act, as amended, is the statute that governs the development and exploitation of mineral deposits. Minerals, as defined in Section 209 of the Act, include all minerals and materials in or under the land of a kind ordinarily worked for removal by underground or surface workings; they do not, however, include peat cut for purposes other than for sale. Mineral development is specifically addressed in the Town and Country Planning (Minerals) Regulations, 1971, and the Town and Country Planning (Minerals) Act, 1981.

Mineral rights to mineral fuels, such as coal, petroleum, and uranium, belong to the state. The Coal Authority, established in 1994 pursuant to the Coal Industry Act, is authorized to license open pit and underground mines to the private sector subject to restrictions on their size and the payment of a royalty on the amount of coal produced. The Petroleum (Production) Act 1998 and the Continental Shelf Act, 1964, provide that oil and gas in the United Kingdom, both onshore and offshore in territorial waters and the United Kingdom continental shelf, belong to the state. Onshore activities require a license, which grants exclusive rights to explore for and develop oil and gas within land areas of Great Britain. In June 2014, the Government introduced the Petroleum Licensing (Exploration and Production) (Landward Areas) Regulations, 2014 (the 2014 Regulations). These regulations, which apply to any license granted on or after July 17, 2014, altered the clauses for new onshore petroleum exploration and development licenses. The new clauses consider the wide distribution of shale reserves across license areas, clarify the process for time extensions, and accelerate the dissemination of geologic data and operational results from hydraulic fracturing. The Finance Act, 2014, also contains measures designed to promote onshore oil and gas projects, including an onshore tax allowance, which secures a portion of the profits of onshore oil and gas projects from certain taxes. Most other mineral rights in England, Scotland, and Wales are privately owned, and there is no specific national licensing system for their exploration and extraction, but planning permission must be obtained from a mineral planning authority for their extraction. Exceptions are gold and silver, which are vested in the Crown State; a license is required for the exploration and development of these metals (British Geological Survey, 2015; Dewar and Ofori-Quaah, 2015, p. 271; Rafferty, 2015, p. 189).

A different situation regarding mineral rights applies to Northern Ireland where, under the Mineral Development Act (Northern Ireland), 1969, the rights to work minerals and to license others to do so are vested in the Department of Enterprise, Trade and Investment, which grants prospecting and mining licenses to commercial companies for exploration and development of minerals. The three main exceptions are gold and silver, minerals that were being worked at the time of the 1969 Act, and common substances, such as aggregates and (or) sand and gravel (Dewar and Ofori-Quaah, 2015, p. 271).

Production

The production of a number of mineral commodities increased significantly in 2014. Fluorspar output increased by 157%; barite, by 47%; other clays (including shale), by 6%; hydraulic cement, by 13%; and slate, by 13%. The increases in the production of fluorspar and barite may be attributed to the reestablishment of mining facilities in Derbyshire in 2012 and the subsequent rampup in production during the past 2 years.

The production of primary lead metal decreased by an estimated 13.9%, and marketable natural gas decreased by an estimated 12.3% (table 1).

Structure of the Mineral Industry

The United Kingdom is home to several leading mineral and mineral processing companies. London is the main market for trade in metals, and metal-commodities-backed financial instruments, such as delivery contracts, futures, and swaps. Among the leading domestic companies, BP p.l.c. and Royal Dutch Shell plc are among the most significant in terms of value (financial performance), as they ranked second and fifth, respectively, among global energy companies in 2014 (Platts McGraw Hill Financial, 2015). Glencore plc is a major Anglo-Swiss trading and mining conglomerate with operations throughout the world. In the United Kingdom it produces primary and secondary lead through subsidiaries. UK Coal Production Ltd. is the principal owner and operator of underground coal mines in the United Kingdom. Table 2 is a list of major mineral industry facilities in the country.

Mineral Trade

In 2014, the United Kingdom's major trade partners were European Union (EU) member countries, the United States, and China. The major import partners of the United Kingdom in 2014 were Germany (which provided 14.4% of imports to the United Kingdom), China (9.2%), the United States (8.4%), the Netherlands (7.7%) and France (6.3%). The major export partners of the United Kingdom in 2014 were the United States (which received 12.6% of the United Kingdom's exports), Germany (10.2%), the Netherlands (7.2%), Switzerland (6.9%), and France (6.4%). The value of the United Kingdom's exports in 2014 was $511.1 billion, and imports were valued at $694.3 billion, resulting in a trade deficit of $183.2 billion for the year. The country's major imports in 2014 were machinery (12.3% of total imports); mineral fuels and oil (11.7%); vehicles (11.0%); electronic equipment (8.9%); and gems, precious metals, and coins (5.2%). The country's major exports in 2014 were machinery (14% of total exports), mineral fuels and oil (10.8%), vehicles (10.6%), gems and precious metals (10.5%), and pharmaceuticals (6.6%) (Department for Business Innovation and Skills, 2015).

Commodity Review

Metals

Aluminum.—Rio Tinto Alcan Ltd.'s smelter at Lochaber, Scotland, with an annual capacity of 47,000 metric tons per year (t/yr), is the United Kingdom's only operating primary aluminum smelter since the closures of the Anglesey Aluminium Metal Ltd. facility in Holyhead, Wales, in September 2009, and the Rio Tinto Alcan Ltd. facility at Lynemouth, England, in March 2012. Primary aluminum production at the Lochaber smelter was 42,000 metric tons (t) in 2014, representing a decrease of 4.6% from the country's production of 44,000 t in 2013 (tables 1, 2; Homewood, 2015; Rio Tinto plc, 2015, p. 195, 216).

Gold.—The Crown State is the commercial agent for the British Government in charge of providing licenses for the development and production of gold and silver in the United Kingdom. In 2014, there was only one producing gold mine in the United Kingdom. The Cavanacaw open pit mine, operated by Omagh Minerals Ltd. (wholly owned by Galantas Gold Corp. of Canada), is located in Northern Ireland. In 2013, the latest year for which information was available, the mine produced 42 kilograms (kg) of gold valued at GBP1 million ($1.6 million[1]). The company's 2014 revised assessment of gold resources indicated an overall 19% increase in resources since the 2013 report. The Kearny and Joshua veins at the mine were targets for future underground mining (McFarlane and others, 2009; Galantas Gold Corp., 2014; Bide and others, 2015, p. 10, 13; Mining-technology.com, 2016).

In 2014, Scotgold Resources Ltd. (Australia) continued work to advance the Cononish gold and silver project to production. Work also continued on early stage regional exploration activities on the nearby Grampian project, which was prospective for both gold and base metal occurrences. Both projects are located near the town of Tyndrum in the Grampian Highlands of midwestern Scotland. As of mid-2014, the reported mineral resources at Cononish, including measured, indicated, and inferred, totaled 460,600 t grading at 11.7 grams per metric ton (g/t) gold and 45 g/t silver. Given the grade range, the inferred mineral resource was estimated to be between 2,640 kg (85,000 troy ounces) and 3,950 kg (127,000 troy ounces) of gold. The company thought the Cononish project could be in production within 18 months of obtaining financing (Scotgold Resources Ltd., 2014, p. 2–5, 7, 9).

Industrial Minerals

Barite.—The United Kingdom's barite production was dominated by M–I Drilling Fluids (UK) Ltd., which operated the underground Foss Mine located near Aberfeldy in Perthshire County, Scotland. The production of this mine accounted for most of the production in the United Kingdom; the remaining output of barite was from the Southern Pennine Orefield where barite was derived as a byproduct of fluorspar mining (table 2).

Fluorspar.—British Fluorspar Ltd., a wholly owned subsidiary of the Fluorsid Group, was established in 2012 to resume operations of the fluorspar mining facilities in Derbyshire, England, which ceased mining and was placed on care-and-maintenance status in 2010. In 2013, the company began production of fluorspar with byproduct barite and lead from the Milldam underground mine. In 2014, the company was granted permission by the Peak District National Park Authority to increase production over the next 15 years and to increase mine truck traffic from 60,000 t/yr to 150,000 t/yr. In 2014, production was 65,000 t of fluorspar and 10,000 t of barite (British Fluorspar Ltd., 2014; Derbyshire Times, 2014; UK Minerals Forum, 2014, p. 8).

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[1] Where necessary, values have been converted from British pounds (GBP) to U.S. dollars (US$) at an average annual exchange rate of GBP0.6072=US$1.00 for 2014.

Mineral Fuels

Coal.—Domestic coal production in the United Kingdom decreased by about 9% in 2014 to an alltime low of 11.6 million metric tons (Mt) as compared with 12.8 Mt in 2013. This decrease was owing to the closure of a number of mines in 2013 and increasingly unfavorable geologic conditions, such as thinner coal seams, at some mines. Over the past 40 years, the principal use of coal in the United Kingdom has been for electrical generation, which consumes on average 80% of the annual coal supply. To meet this demand, combined with falling levels of domestic coal production, the United Kingdom has increasingly relied on imported coal, which totaled 42 Mt in 2014, a decrease of 15% compared with 2013. The decrease was owing largely to decreased demand by electricity producers, who were in turn driven by outages and closures of power stations and a lower demand for electricity overall. Russia contributed 46% of bituminous coal imports in 2014; Colombia and the United States (combined) provided another 50%. Australia, Russia, and the United States contributed 89% of coking coal imports. At the end of 2014, employment in coal mines totaled 3,601 people (table 1; Bide and others, 2015, p. 13; Department of Energy and Climate Change, 2015; MacLeay and others, 2015, p. 43–45; Michaels, 2015).

In 2014, 81% of the country's coke supply was produced domestically; the remainder was imported from Australia, Russia, and the United States. The production of coke decreased by 4.5% (to 3.6 Mt) in 2014, compared with 2013. The only dedicated coke plant in the United Kingdom, Monckton Coke and Chemicals, closed in December 2014, however, coke was still being produced and used at several steelworks (MacLeay and others, 2015, p. 48).

Natural Gas and Petroleum.—In 2014, the United Kingdom was the leading producer of oil and the second-ranked producer of natural gas in the EU. Crude oil production was approximately 310 million barrels and natural gas production was 36.6 billion cubic meters in 2014. After many years of exporting domestically produced oil and natural gas, production declined recently owing to high tax rates and aging oil fields and infrastructure. In 2013, the United Kingdom became a net importer of petroleum products for the first time since 1984. At the end of 2014, the United Kingdom's total proved crude oil reserves were 3.0 billion barrels, which was the largest within the EU; the reserves were located mostly in the North Sea on the United Kingdom Continental Shelf (UKCS). More than 90% of the country's oil production came from the central and northern sections of the North Sea. Production of crude oil and natural gas liquids from the North Sea fields decreased by 1.8% in 2014, compared with 2013. The Buzzard oilfield in the central North Sea was the most prolific oilfield on the UKCS. The northern North Sea, east of the Shetland Islands, also contains considerable reserves, and smaller deposits are located in the North Atlantic Ocean. Besides these offshore assets, the Wytch Farm field in Dorset, England, was the largest onshore oilfield in western Europe. Production at the six major operating refineries in the United Kingdom decreased by 7.8% in 2014 compared with 2013. The oil and gas industry employed a total of 375,000 people in 2014, of which 30,000 were directly employed by exploration and production companies (Lewis and others, 2014, p. 25; offshore-technology.com, 2014; U.S. Energy Information Administration, 2014; BP p.l.c., 2015, p. 6, 8, 22; MacLeay and others, 2015, p. 61).

AB Nynas Ltd. of Sweden ceased processing crude oil at its petroleum refinery at Dundee, Scotland, in December 2013, citing oversupplied markets with no short-term improvement expected. The refinery was converted into a bitumen depot and distribution point and would continue to manufacture specialized bitumen for local and United Kingdom markets (Argo, 2014; AB Nynas Ltd., 2015, p. 7, 16).

Outlook

The United Kingdom's manufacturing industry is expected to continue to rely on imported raw minerals owing to the current lack of domestic exploitation of these resources. However, production of some mineral commodities, such as fluorspar and barite, has increased during the past few years owing to reestablished and expanded production at existing mines. Gold production will likely increase in the near- to medium-term at the Cavanacaw Mine in Northern Ireland owing to an increase in assessed gold resources and the potential for developing underground mining. Development is expected to continue on the Cononish and Grampian gold projects in western Scotland. Wolf Minerals Ltd. (Australia) is developing the first new mine in the United Kingdom in nearly 50 years. Initial production from the planned open pit mine at the Drakelands (formerly Hemerdon) tungsten mine project in Devon was expected towards the end of 2015. The mine has the potential to be one of the largest tungsten and tin resources in the Western Hemisphere. Wolf Minerals Ltd. anticipated that its processing plant would produce approximately 5,000 t/yr of tungsten concentrate and 1,000 t/yr of tin concentrate. Sirius Minerals Plc secured sales agreements and commitments from customers in Africa, Europe, South America, and Southeast Asia and for polyhalte from the company's York potash project, the world's largest and highest grade deposit of polyhalite. The agreements point to a growing global market for the mineral. Although the United Kingdom remained a significant producer of crude oil and natural gas in Europe in 2014, the decline in domestic production of these commodities was expected to continue into 2015 owing to aging fields and infrastructure and diminishing prospects for substantial new discoveries. At the same time, the tax structure for the industry is being reviewed. The production of steel will likely remain stable and continue to reflect international trends in demand (Galantas Gold Corp., 2014; Leonida, 2014; Sirius Minerals Plc, 2014; U.S. Energy Information Agency, 2014, p. 4; Wolf Minerals Ltd., 2016).

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TABLE 1
UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2010	2011	2012	2013	2014[e]
METALS						
Aluminum, metal:						
Primary		186,000	213,000	60,000	44,000	42,000 [2]
Secondary		99,600 [r]	99,200 [r]	148,800 [r]	148,800 [r]	149,000
Total		285,600 [r]	312,200 [r]	208,800 [r]	192,800 [r]	191,000
Iron and steel:						
Metal:						
Pig iron	thousand metric tons	7,233	6,625	7,183	9,471	9,705 [2]
Steel:						
Crude	do.	9,709	9,478	9,579	11,858	12,120 [2]
Hot-rolled	do.	8,395	7,963	7,042	8,031	8,087 [2]
Lead:						
Mine output, Pb content[e]		400 [r]	300	100	100 [r]	100
Metal:						
Smelter, bullion from imported concentrate[e]		36,000	36,000	36,000	36,000	36,000
Refined:						
Primary[3]		151,000	125,000	157,000	174,200 [r]	150,000
Secondary[4]		150,000 [r]	150,000 [r]	155,000	155,000	155,000
Total		301,000 [r]	275,000 [r]	312,000	329,200 [r]	305,000
Nickel, metal[5]		31,600 [r]	37,400	34,300	40,400 [r]	40,000
INDUSTRIAL MINERALS						
Barite[6]		34,099 [r]	31,000	30,000	30,000	44,000
Cement, hydraulic[e]	thousand metric tons	7,880 [r]	8,530 [r]	7,950	8,200 [r]	9,300 [2]
Clays:						
Fire clay	do.	110	162	96	105 [r]	100
Kaolin, china clay[e, 7]	do.	1,140 [r]	1,290 [r]	1,150	1,110	1,090
Ball clay and pottery clay[e, 8]	do.	900 [r]	930 [r]	750	740	733
Other, including shale	do.	5,934	6,154	5,497	6,464 [r]	7,500
Feldspar, china stone[e]		500	500	--	--	--
Fluorspar, all grades[9]		26,420 [r]	--	--	30,000 [e]	77,000
Gypsum and anhydrite[e]	thousand metric tons	1,200	1,200	1,200	1,200	1,200
Lime, hydrated and quicklime[e]	do.	1,500	1,500	1,500	1,500	1,600
Nitrogen, N content of ammonia[e]	do.	1,100	1,100	1,100	1,100	1,100
Potash, KCl product[e]		700,000	770,000	900,000	900,000 [r]	900,000
Salt, all kinds:	thousand metric tons	6,666	6,060	6,152	6,601 [r]	6,600
Sand and gravel, common sand and gravel[e]	do.	61,700 [r, 2]	63,087 [r]	56,640 [r]	57,977 [r]	62,200
Sodium compounds, carbonate, n.e.s.[e, 10]	do.	1,000	1,000	1,000	1,000	1,000
Stone:						
Chalk	do.	3,626	3,996	3,473	3,528 [r]	3,800
Dolomite	do.	4,540	4,490	4,896	3,432 [r]	(11)
Igneous rock	do.	44,876	44,400	40,200	40,500 [r]	44,000
Limestone	do.	56,985 [r]	58,100 [r]	54,800	56,900 [r]	65,500 [11]
Sandstone[e]	do.	11,556 [2]	12,300	11,500	11,500 [r]	12,500
Slate, including fill	do.	695	763	701	885 [r]	1,000
Total	do.	122,278 [r]	124,049 [r]	115,570	116,745 [r]	126,800
Talc, soapstone, pyrophyllite		2,633 [r]	3,708 [r]	3,667 [r]	2,947 [r]	3,000
Titanium, titanium dioxide[e]	thousand metric tons	260 [r]	280 [r]	200	220 [r]	200
MINERAL FUELS AND RELATED MATERIALS						
Coal, anthracite and bituminous	thousand metric tons	18,347 [r]	18,552 [r]	16,967 [r]	12,767 [r]	11,648 [2]
Coke:						
Metallurgical	do.	3,990 [r]	4,021 [r]	3,712 [r]	3,769 [r]	3,601 [2]
Breeze, all types	do.	32 [r]	31 [r]	31 [r]	32 [r]	31 [2]
Gas, natural, marketable[12]	billion cubic meters	59	66	57 [e]	57 [e]	50
Peat	thousand cubic meters	1,004	825	568 [r]	1,254 [r]	1,300
Petroleum:						
Crude[13]	thousand 42-gallon barrels	430,791	422,568	368,139	312,878	310,250 [2]
Refinery products	do.	565,422	565,000	530,308 [e]	530,000 [e]	499,320 [2]

See footnotes at end of table.

TABLE 1—Continued
UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

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[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1] Table includes data available through December 22, 2015.

[2] Reported.

[3] Produced entirely from imported bullion, and includes the lead content of alloys.

[4] Includes a small quantity of primary lead from domestic concentrate.

[5] Refined nickel.

[6] Includes witherite.

[7] Sales, dry weight.

[8] Salable product.

[9] Proportions of grades not available; probably about two-thirds acid grade.

[10] Not elsewhere specified.

[11] Limestone and dolomite reported together in 2014.

[12] Methane, excluding gas flared or reinjected.

[13] Excludes gases and condensates.

TABLE 2
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Aluminum:			
Primary	Rio Tinto Alcan Ltd.	Lynemouth Smelter, Northumberland County, England (closed in March 2012)	182
Do.	do.	Lochaber Smelter, Fort William County, Scotland	47
Do.	Anglesey Aluminium Metal Ltd. (Rio Tinto Corp., 51%, and Kaiser Aluminum and Chemical Corp., 49%)	Holyhead, Gwynedd County, Wales (closed in September 2009)	144
Secondary	Hydro Aluminium Deeside Ltd. (Hydro Aluminium AS)	Wrexham, Clwyd County, Wales	63
Do.	Cohen Alloys Ltd. (Ensco 178 Ltd.)	Glasgow, Scotland	10
Do.	Coleshill Aluminium Ltd.	Coleshill, Warwickshire, England	15
Barite	M–I Drilling Fluids (UK) Ltd.	Foss Mine, near Aberfeldy, Perthshire County, Scotland	50
Do.	British Fluorspar Ltd. (Fluorsid Group s.r.l., 100%)	Arthurton West, Bow Rake, High Rake, and Watersaw Mines, Southern Pennine Orefield, Derbyshire County, England	15
Cement	Lafarge Tarmac (Lafarge S.A., 50%, and Anglo American plc, 50%)	Aberthaw plant, East Aberthaw, Barry, South Glamorgan County, Wales	500[2]
Do.	do.	Barnstone plant, near Langar, Nottinghamshire County, England (closed 2006)	--[3]
Do.	do.	Cauldon plant, near Leek, Staffordshire County, England	900
Do.	do.	Cookstown plant, Cookstown, County Tyrone, Northern Ireland	480
Do.	do.	Dunbar plant, Dunbar, East Lothian, Scotland	1,150
Do.	do.	Tunstead plant, Buxton, Derbyshire County, England	1,095
Do.	Hanson Cement (HeidelbergCement AG, 100%)	Ketton plant, Rutland County, near Stamford, Lincolnshire County, England	1,390
Do.	do.	Padeswood plant, Mold, Flintshire County, Wales	820
Do.	do.	Ribblesdale plant, Clitheroe, Lancashire County, England	960
Do.	CEMEX UK Operations, Ltd. (CEMEX, S.A.B. de C.V., 100%)	Rugby plant, Rugby, Warwickshire County, England	1,800
Do.	do.	South Ferriby plant, North Lincolnshire County, England	750
Do.	Hope Construction Materials Ltd. (ArcelorMittal)	Hope plant, Hope Valley, Derbyshire County, England	1,300
Clay:			
Ball clay	WBB Minerals (S.C.R.-Sibelco NV)	Various operations in northern and southern Devon County, England	500
Do.	Imerys Group	Operations in Bovey and Wareham Basins, Dorset County, England	300
China clay (kaolin)	do.	Mines and plants in Cornwall and Devon Counties, England	3,000
Do.	WBB Minerals (S.C.R.-Sibelco NV)	Mines and plants in Cornwall County, England	1,000

See footnotes at end of table.

TABLE 2—Continued
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Coal:				
Underground mines		UK Coal Production Ltd.	Operations in England include the Kellingley Colliery, North Yorkshire County, and the Thoresby Colliery, Nottinghamshire County.	30,000
Surface pits		Celtic Energy Ltd.	Nant Helen Extension pit, Abercraf, West Glamorgan, Wales	400
Do.		do.	Selar pit, Glynneath, West Glamorgan, Wales	400
Do.		do.	East Pit East, Tairgwaith, West Glamorgan, Wales	350
Do.		Energybuild Ltd.	Nant-y-Mynydd pit, Neath, West Glamorgan, Wales	130
Fluorspar		British Fluorspar Ltd. (Fluorsid Group, 100%)	Mill at Stoney Middleton, mines in Derbyshire County, England	65
Gold	kilograms	Galantas Gold Corp.	Omagh Mine, near Omagh, County Tyrone, Northern Ireland	900 [4]
Gypsum		British Gypsum Ltd. (Saint-Gobain S.A., 100%)	Several mines and quarries in England, which include the Barrow Mine, Barrow upon Soar, southeast of Loughborough, Leicestershire County; the Brightling Mine, Robertsbridge, East Sussex County; the Birkshead Mine, Kirby Thore, near Penrith, Cumbria County; the Fauld Mine, Tutbury, near Burton on Trent, Staffordshire County; the Kilvington Quarry, Staunton in the Vale, Kilvington, Nottinghamshire County; the Marbleegis Mine, East Leake, northeast of Loughborough, Leicestershire County; the Newbiggin Mine, Newbiggin, near Kirby Thore, Cumbria County	3,500
Lead:				
Primary		Britannia Refined Metals Ltd. (Glencore plc)	Northfleet, Kent County, England	180
Secondary		Britannia Recycling Ltd. (Glencore plc)	Wakefield, West Yorkshire County, England	20
Do.		H.J. Enthoven Ltd. (Quexco Inc., 100%)	Darley Dale, Derbyshire County, England	75
Natural gas	billion cubic meters	Numerous domestic and international oil companies	North Sea gasfields	100
Nickel, refined		Vale Europe Ltd. (Vale S.A.)	Clydach Refinery, near Swansea, West Glamorgan County, Wales	40
Nitrogen, N content of ammonia		GrowHow UK Ltd. (Kemira GroHow Oyj)	Ince, Lancashire County, England	400
Petroleum:				
Crude	million 42-gallon barrels per day	Numerous domestic and international oil companies, which include Apache North Sea Ltd., BG Group, BHP Billiton Ltd., BP p.l.c., Challenger Minerals Inc., Chevron Corp., ConocoPhillips Corp., Dana Petroleum plc, Eni S.p.A.., Exxon Mobil Corp., Hess Corp., Lundin Britain Ltd., Maersk Oil UK Ltd., Marathon Oil U.K. Ltd., Midmar Energy Onshore Ltd., Nexen Petroleum Inc., Noble Energy (Europe) Ltd., Oilexco Inc., Perenco UK Ltd., Petro-Canada UK Ltd., Premier Oil plc, Royal Dutch Shell plc, Statoil (U.K.) Ltd.,Talisman Ltd., Total S.A., and Tullow Oil (U.K.) Ltd.	North Sea oilfields	2
Refined	million 42-gallon barrels	Exxon Mobil Corp.	Fawley refinery, Southampton, Hampshire County, England	122
Do.	do.	Essar Energy plc	Stanlow manufacturing complex, Ellesmere Port, Cheshire County, England	98
Do.	do.	ConocoPhillips Co.	Humber refinery, South Killingholme, North Lincolnshire County, England	102
Do.	do.	Total S.A.	Lindsey refinery, Killingholme, North Lincolnshire County, England	81
Do.	do.	Valero Energy Corp.	Pembroke refinery, Pembroke, Dyfed County, Wales	86

See footnotes at end of table.

TABLE 2—Continued
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2014

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Petroleum—Continued:				
Refined—Continued	million 42-gallon barrels	Ineos Group	Grangemouth refinery, Grangemouth, Stirling County, Scotland	88
Do.	do.	Total S.A., 70%, and Murco Petroleum Ltd., 30%	Milford Haven, Dyfed County, Wales (ceased summer 2014)	40
Do.	do.	Eastham Refinery Ltd. (Shell UK Ltd., 50%, and AB Nynas Ltd., 50%)	Eastham refinery, Ellesmere Port, Cheshire County, England	8
Do.	do.	AB Nynas Ltd.	Dundee refinery, Dundee, Scotland	4
Platinum-group metals		Johnson Matthey plc	Refineries at Enfield (London) and Royston, Hertfordshire County, England	NA
Do.		Vale Acton (Vale Group)	Acton refinery, London, England	NA
Potash		Cleveland Potash Ltd. (Israel Chemicals Ltd., 100%)	Boulby Mine, Yorkshire County, England	1,000
Salt:				
Road		British Salt Ltd.	Middlewich, Cheshire County, England	800
Rock		do.	do.	600
Do.		Irish Salt Mining and Exploration Co. Ltd.	Kilroot Mine, Carrick Fergus, Northern Ireland	500
Sand and gravel		Hanson plc (HeidelbergCement AG, 100%)	Various offshore and onshore locations	NA
Silica sand		WBB Minerals (S.C.R.-Sibelco NV)	Various operations in Cheshire, Humberside, and Norfolk Counties, England	5,000
Do.		Hanson plc (HeidelbergCement AG, 100%)	Various locations	NA
Slate, natural		Carillion Plc.	Operations in Wales include the Penrhyn quarry, Bethesda, Conwy County; the Pen Yr Orsedd quarry, Nantlle, Gwynedd County, quarries at Blaenau Ffestiniog and Cwt y Bugail, Gwynedd County	1,000
Do.		Greaves Welsh Slate Company Ltd.	Llechwedd Slate Mines, Blaenau Ffestiniog, Gwynedd County, Wales	NA
Soda ash		Brunner Mond Group (Tata Chemicals Ltd.)	Northwich, Cheshire County, England	900
Steel		Tata Steel Europe (Tata Steel Group)	Scunthorpe Works, Scunthorte, Lincolnshire County, England	4,500
Do.		Tata Steel Europe Teesside Cast Products (Tata Steel Group)	Teesside Works, Redcar, Cleveland County, England	3,900
Do.		Tata Steel Europe Strip Products UK (Tata Steel Group)	Port Talbot works, Port Talbot, West Glamorgan, Wales	3,750
Do.		Tata Steel Europe Engineering Steels (Tata Steel Group)	Rotherham Works, Rotherham, South Yorkshire County, England	1,200
Do.		do.	Stocksbridge Works near Sheffield, South Yorkshire County, England	NA [5]
Do.		Tata Steel Europe Special Profiles (Tata Steel Group)	Skinningrove, Carlin How, near Saltburn-by-the-Sea, Cleveland County, England	NA
Do.		Celsa Manufacturing Ltd. (Grupo Celsa, 100%)	Tremorfa Works, Cardiff, South Glamorgan County, Wales	850
Stone, crushed		Hanson plc (HeidelbergCement AG, 100%)	90 quarries in various locations	70,000
Tin, ore		Celeste Copper Corp.	South Crofty Mine, Cornwall County, England	NA

Do., do. Ditto. NA Not available. -- Zero.

[1] May include historic, postal, or preserved counties instead of current regional governments, such as cities, county boroughs, or unitary authorities.

[2] Grinding plant only. Kilns closed in May 2006.

[3] Grinding and blending plant.

[4] Under construction.

[5] Remelt facilities.

THE MINERAL INDUSTRY OF UZBEKISTAN

By Elena Safirova

Uzbekistan has substantial natural resources, which include more than 1,800 known mineral deposits. Uzbekistan was one of the leading world producers of gold and uranium. The country also produced nitrogen, natural gas, petroleum, rhenium, and sulfur in significant amounts in terms of world production. Other valuable minerals produced included copper, gypsum, silver, tungsten, and zinc. Many other mineral commodities (such as iron ore and lithium) had been identified but were not being mined. During the past several years, however, the country had made significant efforts to increase its mineral production, including through expansion of copper and gold production facilities, construction of new phosphate and potash plants, and development of shale oil and gas condensate deposits (Apodaca, 2016a, b; Flanagan, 2016; George, 2016; Polyak, 2016a, b).

Uzbekistan is an arid, landlocked country with limited infrastructure. Exports of hydrocarbons, primarily natural gas, have provided the main source of hard currency earnings for the past decade. In recent years, output of petroleum and natural gas had decreased and reduced Uzbekistan's export revenue. At the same time, economic growth steadily increased domestic demand for hydrocarbons, which further reduced Uzbekistan's export potential and limited the country's ability to import goods. In 2013 and 2014, Uzbekistan began efforts to reduce domestic consumption and to preserve exports. The country was also making efforts to ramp up domestic coal production, but this measure alone is unlikely to improve the country's energy balance significantly (U.S. Central Intelligence Agency, 2015).

Minerals in the National Economy

In 2014, Uzbekistan's real gross domestic product (GDP) increased by 8.1%; the nominal GDP was 144,868 billion soums ($62.79 billion).[1] The value of exports was reported to be $13.32 billion, which was an increase of 3.8% compared with that of 2013. The main mineral export commodities were ferrous and nonferrous metals, gold, mineral fertilizers, and oil and gas. The country's main export partners were China (which received 26.8% of Uzbekistan's exports, by value), Russia (14.7%), Kazakhstan (14.6%), Turkey (13.1%), and Bangladesh (10.2%). The value of imports increased to $12.5 billion, or by 9.4% compared with that of 2013. The main mineral import commodities were chemicals and ferrous and nonferrous metals. The country's major import partners were Russia (which supplied 22.8% of Uzbekistan's imports, by value), China (19.6%), the Republic of Korea (14.9%), Kazakhstan (10.2%), Germany (4.8%), and Turkey (4.4%) (Center for Economic Research, 2015; U.S. Central Intelligence Agency, 2015).

In 2014, the share of industrial production in the GDP was 51.9%. The main industries (as a percentage of the value produced by all industries) were energy (20.1%), machine building and metal processing (19.7%), food processing (16.0%), textile manufacturing (14.0%), nonferrous mining and metallurgy (8.8%), construction material manufacturing (6.1%), and chemical and petrochemical products (5.5%). In 2014, the value of all industrial production increased by 8.3% compared that of 2013; ferrous metallurgy, by 16.5%; chemical and petrochemical products, by 8.9%; electric power production, by 2.2%; and nonferrous mining and metallurgy, by 1.7%. The value of fuel sector production decreased by 1.9% (Center for Economic Research, 2015).

Foreign direct investment (FDI) increased by $2,310 million in 2014, or by 10.5% compared with that of 2013 and comprised 15.8% of the total investment in Uzbekistan's economy. The loans guaranteed by the Government increased to $639.9 million, or by 10.2% compared with that of 2013. In 2014, the share of FDI in the fuel sector increased to about 60% from 35% in 2013, but the share of FDI in the chemical and petrochemical sector decreased to 0.8% in 2014 from 3.7% in 2013 (Center for Economic Research, 2015; U.S. Central Intelligence Agency, 2015).

Production

In 2014, estimated potash production increased by 30%; coal production, by 7.5%; and cement, by 5%. Estimated gypsum production decreased by 30%; tungsten, by 15%; nitrogen, by 11%; kaolin and molybdenum, by 8% each; and phosphate rock, by 6%. These and other production data are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Copper.—The only producer of copper in Uzbekistan was the Almalyk mining and metallurgical complex (Almalyk GMK), which was located in Toshkent Province (Toshkent Viloyati). Two large copper porphyry deposits, the Kalmakyr and the Sary-Cheku deposits, were the complex's sources of copper. An additional copper deposit, Dal'neye, was on reserve. Kalmakyr and Sary-Cheku had initial total resources of 17 million metric tons (Mt) of copper, about 20% of which was depleted. The mineral deposits of Toshkent Viloyati are highly complex and contain more than 170 types of minerals. In addition to copper, the Almalyk GMK mined and processed lead-zinc-barite ores from the Uch-Kulach deposit, which is located in Jizzax Viloyati, and the Khandiza polymetallic deposit, which is located in Qashqadaryo Viloyati. The Almalyk GMK facilities included eight mines, five mining and beneficiation plants, two metallurgical plants, a cement plant, a sulfuric acid plant, a mechanical plant, and a lime plant. The value of the annual output of the Almalyk GMK was estimated to be $300 million (Almalyk Mining-Metallurgical Complex, 2015).

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[1] Where necessary, values have been converted from Uzbekistani soums (UZS) to U.S. dollars (US$) at an average annual exchange rate of UZS2,307=US$1.00 for 2014.

In 2014, the Almalyk GMK produced an estimated 99,000 metric tons (t) of refined copper and an estimated 99,500 t of copper in concentrate. The company was involved in several investment projects involving expansion, modernization, and construction of new production units. The total cost of the ongoing investment projects was estimated to be $670 million. In 2014, the Almalyk GMK completed four major projects with a total cost of $175 million, of which $76.3 million was from the company's own funds, $80.9 million was in the form of loans from the Fund for the Reconstruction and Development of Uzbekistan (FRRU), and the remainder was loans from Uzbek commercial banks. In particular, the Almalyk GMK built a new mine—which had the capacity to produce 80,000 metric tons per year (t/yr) of ore—at the Kairagach deposit, finished the construction of a 760,000-t/yr cement plant, and completed modernization of its zinc plant (Mineral.ru, 2014f).

The Almalyk GMK continued various activities directed at improvement and expansion of existing production. In particular, it planned to invest $45 million between 2014 and 2016 to expand the Kalmakyr Mine and to develop additional resources. The Almalyk GMK started construction of a new section of the mine and planned to use the heap-leach method to extract copper. When the expansion is completed in 2017, the Almalyk GMK planned to extract and process an additional 4 million metric tons per year (Mt/yr) of ore and to increase copper production by between 2% and 3%. As of 2014, the capacity of the Kalmakyr Mine was 31.5 Mt/yr of ore. The Almalyk GMK planned to expand Kalmakyr using its own funds. Until the end of 2014, the Almalyk GMK planned to start developing the Dal'neye deposit, which for years was considered a reserve that would eventually replace the Kalmakyr and Sary-Cheku Mines (Mineral.ru, 2014a, e; CA-dialog.org, 2015).

In 2014, the Almalyk GMK was modernizing its copper-processing facilities. In January, the Almalyk GMK installed a new high-speed thickener with central drive, which was more energy efficient and easier to load and unload, operate, and maintain than the old peripheral-drive thickener. As a result, the beneficiation plant would realize additional savings on labor and would reduce the production costs for the metal concentrates. At the second stage of modernization, the Almalyk GMK would install new pressure filters to replace old vacuum filters and drying drums. The new equipment would reduce operating costs, including energy costs, simplify technological processes, and improve working conditions (MinerJob.ru, 2014b, f).

Another element of modernizing the beneficiation facilities was the installation of new equipment for preprocessing of ores. At the end of 2013, the company installed equipment for preprocessing 800,000 t/yr of ore as the first stage of modernization. At the second stage, the Almalyk GMK planned to install equipment to handle another 7 Mt/yr of ore. The total cost of the project was $118 million, and its financing came from FRRU ($80 million), AKIB Ipotekabank ($32 million), and the Almalyk GMK's own funds. The project would increase the Almalyk GMK's total ore-processing capacity by 6 Mt/yr of ore, to 37 Mt/yr. As a part of the modernization effort, obsolete equipment (1.8 Mt/yr of capacity) would be replaced with new equipment (Mineral.ru, 2014d; MinerJob.ru, 2014d).

The Almalyk GMK was also engaged in the construction of a new submerged-tuyere-style furnace, which would have the capacity to produce 17,000 t/yr of copper. The project would cost $97.7 million and was scheduled to be completed in September 2016. The company also started a program to improve the energy efficiency of the production process, including the use of solar power, primarily in the transportation department and for heating water. As of June 2014, three solar power installations had been assembled and put in operation (MinerJob.ru, 2014a, c).

At the end of 2013, the Almalyk GMK started production of copper pipe, and in March 2014, the plant started operating at full capacity. UP Angren Kuruv Zavodi would produce copper pipe from copper cathodes produced at other Almalyk GMK facilities. Previously, all copper cathodes produced by the Almalyk GMK were exported. The estimated cost of the investment in pipe production was about $35.5 million and was financed from the Almalyk GMK's own funds ($10.3 million) and by loans from the AKIB Ipotekabank ($25.2 million). The new plant was located in the Angren industrial zone, and the expected capacity was about 8,000 t/yr. The plant would produce a variety of pipe with diameters between 4.5 and 50 millimeters. The output of the pipe plant would be used for household appliances and for transporting gases and liquids in heating, natural gas, and water facilities. The plant's products would be sold domestically and exported. As of March 2014, export contracts were signed with companies in China, Switzerland, and Turkey (Advis.ru, 2014; Azovpromstal.com, 2014; MinerJob.ru, 2014h).

Gold.—The main gold producers of the country were two Government-owned mining and metallurgical complexes—the Almalyk GMK and the Navoi mining and metallurgical complex (Navoi GMK). The Muruntau deposit in the Central Qizilqum region has been mined by the Navoi GMK by open pit method since 1967 and had relatively low extraction costs. According to the State Committee on Geology and Mineral Resources (Goscomgeo), as of the end of 2011, Uzbekistan had 63 identified gold deposits with total proven resources of about 2,500 t of gold. According to Goscomgeo, Uzbekistan was planning to increase gold production in the period between 2015 and 2019 by between 20% and 30%. During these years, the Almalyk GMK and the Navoi GMK were to invest $1.1 billion in gold mining (Dudkin, 2014; Sannikov, 2014; Almalyk Mining-Metallurgical Complex, 2015; Navoi Mining and Metallurgical Combinat, 2015).

The Navoi GMK was the main producer of gold and the only uranium producer in Uzbekistan. The Navoi GMK's share of total gold production in Uzbekistan was about 80%; it had control of 13 gold deposits, most of which were either already being mined or were to be developed in the near future. The Navoi GMK had four production plants that were located in Navoi (GMZ–1), Uchkuduk (GMZ–3), Zarafshan (GMZ–2), and Zarmitan (GMZ–4). At the Karakutan deposit, which was located in Navoi Viloyati, the Navoi GMK planned to combine open pit and underground mining into one complex and, by doing so, to double the mine's capacity. In 2014, the Navoi GMK planned to invest $41 million in modernizing the Karakutan complex and to complete the modernization by the end of the year (Mineral.ru, 2014g).

In February, the Navoi GMK started operations at the new open pit mine at the Bessopantau deposit, which is located in the Central Qizilqum region. Total investment in the mine was estimated to be about $60 million, and the full production capacity of 15 million cubic meters per year (about 23 Mt/yr) of ore was to be reached in 2015. According to the Navoi GMK, gold resources at Bessopantau suggest that similar resources were likely present in the Muruntau Mine, which was the major operating mine of the complex (Mineral.ru, 2014h).

In 2014, the Navoi GMK was also planning to increase its investment in exploration for gold and uranium by 10%, to $25 million. In 2014, exploration was planned in the western part of the country, in the east, and in Karakalpakstan. The goal of the exploration was to replace diminished mineral resources and to increase the knowledge about presently identified resources. As a result of exploration, the Navoi GMK expected to increase its gold and uranium resources by between 10% and 12%. In 2011, the Navoi GMK created a new division—a scientific production center (NPC) called the NPC Geology of Precious Metals and Uranium. The center replaced two science and technology centers that had operated under the auspices of Goscomgeo—the NPC Geology of Precious and Nonferrous Metals and the NPC Geology of Uranium and Rare-Earth Metals (Mineral.ru, 2014i).

In 2012, the Almalyk GMK started construction of three new gold mines—the Kairagach Mine, the Kochbulak Mine, and the Samarchuk Mine. All the deposits are located in Toshkent Viloyati, and the total cost of construction was expected to reach $132 million. The construction of the three mines was expected to increase the Almalyk GMK's gold production by between 25% and 30% and to reach about 33 t/yr of gold. The Samarchuk Mine was to be constructed at the Kyzyl-Alma deposit. The new mine was expected to have an annual capacity of 100,000 t/yr of ore. Construction of the Samarchuk Mine would cost $66.3 million, and it was to be financed by the FRRU ($14.2 million), Uzbek banks ($25.1 million), and the Almalyk GMK's own funds. In March 2014, Western Ural Machine Building group (ZUMK) of Russia began construction of the vertical shaft of the mine. The mine was expected to be completed by the end of 2015 (Mineral.ru, 2014c).

The construction of the Kairagach Mine was completed in December 2014. The total production capacity of the new mine was expected to be 80,000 t/yr of ore. The mine's construction cost a total of $30.6 million, which was financed by Uzbek banks, which loaned $13.2 million; the FRRU, which loaned $6.7 million; and the Almalyk GMK's own funds (Mineral.ru, 2015).

Tungsten.—In 2014, the production of tungsten metal decreased to 83 t, or by 15.3% compared with that of 2013. The decrease was owing to reduced demand on international markets. The only producer of tungsten metal in Uzbekistan was the Uzbek refractory and hard metals complex (UzKTZhM). Reportedly, the plant was operating at about 20% of its capacity and produced tungsten metal from imported tungsten concentrates (Regnum.ru, 2015).

In June 2013, Goscomgeo and Shindong Resources of the Republic of Korea created a joint venture, SP Uzbekistan-Korea Tungsten. The joint venture planned to develop and mine the Sautbay tungsten deposit, which is located in Navoi Viloyati. The joint venture planned to complete the resource estimate in the first half of 2014 and to prepare the technical and economic assessment during the second half of the year. If the project is confirmed, mine construction would start in 2016. According to preliminary estimates, the $145 million project would include the construction of a mining and beneficiation complex with the capacity to produce 1,500 t/yr of tungsten concentrate. Previously, the company had planned to start mine construction as early as 2014. The joint venture anticipated mining three deposits—the Butgut, the Sagynkan, and the Sautbay. According to Goscomgeo, the C1-category resources (similar to the indicated resource category in U.S. Geological Survey terminology) of the Sautbay deposit were 4 Mt containing 19,900 t of tungsten trioxide (MinerJob.ru, 2014e, g).

The Government decided to postpone indefinitely the project to restore tungsten production at the Ingichke deposit in Samarqand Viloyati owing to overproduction and low prices on the world market. The first phase of the project was to include restoration of the tungsten mine at a cost $50 million. The mine was expected to have the capacity to produce at least 300,000 t/yr of ore. The second stage would include construction of a new mining and beneficiation complex; the cost and capacity of the complex were yet to be determined. During the past 2 years, Goscomgeo had been in talks with several Chinese and South Korean companies but was unable to find project participants. Tungsten had been mined previously at Ingichke between 1941 and 1996. The mine was mothballed in 1996 owning to low tungsten prices on the world market (UzDaily.uz, 2014c).

Industrial Minerals

Cement.—In 2014, Uzbekistan increased cement production by 5.1% (to 7.35 Mt) compared with that of 2013. At the beginning of the year, the country had four significant cement plants—OAO Akhangarancement, OAO Bekabadcement, OAO Kuvasaycement, and OAO Kyzylkumcement. OAO Kyzylkumcement had the capacity to produce 3.1 Mt/yr of cement; OAO Akhangarancement, 1.74 Mt/yr; OAO Kuvasaycement, 1 Mt/yr; and OAO Bekabadcement, 820,000 t/yr (Raduzhnaya, 2015).

In March 2014, the Almalyk GMK opened a new cement plant in the Zafarabad region of Jizzax Viloyati. The new plant had the capacity to produce 760,000 t/yr of regular portland cement and another 350,000 t/yr of white portland cement. The total cost of the project was about $114 million. Out of this amount, $46.1 million came from the Almalyk GMK's own funds and $74.2 million was provided by the FRRU. The Almalyk GMK had a plan to spend another $35.8 million to expand the plant's production capacity for regular portland cement to 1 Mt by 2016. Of the total cost, $9 million would come from the Almalyk GMK's own funds, $14 million would be provided by the FRRU, and the remainder would be provided by Uzbek commercial banks in the form of loans. The company was also planning to build another cement plant in the Sherabad region of Surxondaryo Viloyati by 2019. The plant would have the capacity to produce 1.5 Mt/yr of cement. The preliminary cost estimate for the project was $225 million; $24.4 million would come from the Almalyk GMK's own funds, $90 million would be provided by the FRRU, and the remainder would come as loans from Uzbek commercial banks (Raduzhnaya, 2015; Review.ru, 2015a, b).

Between 2014 and 2016, cement plants in Uzbekistan planned to invest about $50 million in modernization of equipment and to increase production capacity. OAO Kyzylkumcement was to invest $39.6 million in three projects over 3 years, mostly from the company's own funds, including construction of a new 500,000-t/yr mill, modernization of the clinker production line, and construction of a new central power substation. OAO Bekabadcement planned to modernize its milling division by investing $5.5 million. OAO Kuvasaycement had two modernization projects with a total cost of $2.07 million. According to Government forecasts, cement production in Uzbekistan during the next 5 years would increase by 3.5% per year on average and would reach 8.9 Mt/yr in 2020 (UzDaily.uz, 2014a, b; ITE-Uzbekistan.uz, 2015; Review.ru, 2015a).

OAO Akhangarancement was part of the ZAO Eurocement Group of Russia (Eurocement) and produced 1,700,500 t of cement in 2014. The plant was acquired by Eurocement in 2006, and since then, Eurocement had invested about $21.5 million in the plant. In July, the Economic Court of Toshkent Viloyati seized the property and bank accounts of Eurocement following the court's decision to find in favor of the Government Agency for Competition and to invalidate the plant's privatization, which had taken place 20 years ago in accordance with the Government's decision. The company estimated Eurocement's losses from the decision to be $900 million, and it planned to appeal the court's decision in higher courts and international organizations. Earlier, Eurocement had planned to expand the plant, and in June, it signed a $128 million contract with China CAMS Engineering for the construction and the supply of equipment to build a new cement plant with a total capacity of 2.4 Mt/yr. The new plant was expected to be commissioned in 2016. It was not clear if the company would continue with the modernization plans amid court appeals (Eurocement.ru, 2014; RapsiNews.ru, 2014; Vedomosti.ru, 2014; Ut.uz, 2015).

Potash.—In March, the Dekhkanabad potash plant commissioned its second production line, which had a total capacity of 400,000 t of potassium chloride. The plant was located in Qashqadaryo Viloyati, close to the border with Turkmenistan. Total resources of the Tyubetagan deposit were estimated to be 400.2 Mt grading 36.8% potassium chloride. About 200 Mt was estimated to be located in the Uzbek part of the deposit. Construction of the new production line cost $254.5 million, of which $110.5 million was financed by the Eximbank of China, $128.1 million was a loan from the FRRU, and the remainder came from GAK Uzkimyosanoat, which was the operator of the potash complex. The construction was performed by CITIC International Cooperation Co. Ltd. of China, and the equipment was provided by ZUMK Russia. In addition to processing facilities, an important element of construction was a 33-kilometer-long aerial ropeway with the capacity to transport 2.1 Mt/yr of ore. The ropeway would be used to connect the Tyubetagan potash mine with the complex of processing facilities. The aerial ropeway was designed by the Engineering Division of ZUMK and was scheduled to be commissioned in the third quarter of 2014; until then, trucks would transport ore to the processing facilities (Trend.az, 2014).

The first production line of the Dekhkanabad plant had been commissioned in September 2010. The project cost was $123.7 million, and the production line capacity was 200,000 t/yr of potassium chloride. FRRU and Eximbank of China provided $61.9 million and $41.7 million, respectively, in loans, and the remainder of the financing came from GAK Uzkimyosanoat's own funds. The Dekhkanabad potash plant expected to produce 280,000 t of potassium chloride and to export 208,000 t in 2015 (UzDaily.uz, 2013; Infoindustria.com.ua, 2015).

Mineral Fuels and Related Materials

Natural Gas and Petroleum.—In 2014, Uzbekistan produced an estimated 55 billion cubic meters of natural gas and an estimated 2.9 Mt of petroleum. The Government of Uzbekistan did not report the country's production of hydrocarbons for 2013 or 2014. The hydrocarbon industry employed only about 1% of the country's employed population (about 125,000 people), but it produced 16% of the country's GDP and 20% of Government revenues (OilNews.com.ua, 2014b).

National Holding Company (NHC) Uzbekneftegaz, which was the sole operator of the oil and gas complex in Uzbekistan, reported that it was planning to increase all hydrocarbon production by 1.9% by 2019 compared with the production level of 2014, including a 2% increase in the production of natural gas. The new Government program sought to increase hydrocarbon production in order to an increase the country's natural gas identified resources by 365 billion cubic meters, and its liquid hydrocarbon resources, by 31.7 Mt. Uzbekistan's proven petroleum reserves as of 2013 were 100 Mt (or 600 million barrels), and the reserves of natural gas were 1.1 trillion cubic meters. According to the Government program, Uzbekistan planned to increase hydrocarbon exports by 20% by 2020 through conserving decreasing domestic natural gas use and energy consumption. In particular, by 2020, natural gas consumption by industrial users was expected to decrease by between 5% and 7% compared the 2013 consumption, and natural gas consumption by residential customers was expected to remain unchanged from the 2013 level. The Government program also sought to increase oil refining by about 30%, by increasing the refining of locally produced petroleum and condensate, by increasing the production of shale oil, and by importing crude oil for refining (NHC Uzbekneftegaz, 2015; RIANovosti, 2015).

According to Uzbekneftegaz, Uzbekistan had 211 identified hydrocarbon deposits, of which 108 contained natural gas and gas condensate, and others contained petroleum, petroleum and natural gas, or petroleum and gas condensate. About

50% of them were in development, 35% were prepared for development, and the others were in development stages (NHC Uzbekneftegaz, 2015).

In March 2013, Uzbekistan announced the beginning of drilling at the Sangruntau shale oil deposit, which is located in northern Navoi Viloyati. The total cost of the project was estimated to be $600 million, and it was expected that shale oil production would be able to offset the decrease in conventional oil production in the country. The project was expected to produce 8 Mt/yr of shale oil and about 1 Mt/yr of refinery products. Total resources of shale oil in Uzbekistan were estimated to be 47 billion metric tons. It was not clear whether the project was affected by the reduction in oil prices in 2014 (Rosbalt.ru, 2013).

NK Lukoil of Russia was actively participating in various projects in Uzbekistan and, during the past 10 years (between 2004 and 2014), it had invested about $3 billion in the country. Lukoil signed a production-sharing agreement (PSA) for the Kandym-Khauzak-Shady-Kunrad group of gas condensate deposits in 2004, and in 2007, production started at the Khauzak sector. In 2007, Lukoil signed a PSA for the South-Western Gissar project. Production at the Gissar project, which started in 2011, was 4.2 billion cubic meters per year of natural gas, and the total investment was $1.2 billion. Lukoil was also a participant in a PSA for the development of hydrocarbons in the Aral license block, which is located in Uzbekistan's Aral Sea waters. In 2014, Lukoil's cumulative production in the country reached 25 million cubic meters of natural gas. By 2020, Lukoil planned to produce between 17 billion and 18 billion cubic meters per year of natural gas (Mineral.ru, 2014b; VestiFinance.ru, 2014).

In 2014, Uzbekistan had three oil refineries—Alty-Aryk NPZ, Bukhara NPZ, and Fergana NPZ—with a total annual capacity of 11.2 Mt/yr, but they were working well below capacity. All three refineries were owned and operated by AK Uznefteprodukt, which was a subsidiary of NHC Uzbekneftegaz. In 2014, the Government planned to improve the financial condition of Bukhara NPZ and Fergana NPZ by reducing production costs, reducing unpaid debt by the refineries' customers, and increasing capacity utilization by importing petroleum. The problems faced by the refineries were partly owing to a reduction in crude petroleum production in the country, a significant reduction in capacity utilization, and the refineries' need for modernization (OilNews.com.ua, 2014a).

Outlook

During the past several years, Uzbekistan has intensified its efforts to increase the country's industrial production, especially, automobile, chemical, construction products, and machine-building manufacturing. In 2014, the share of the country's GDP produced by industrial enterprises was 51.9%. Eventually, increased industrial production and higher living standards in the country are expected to increase the demand for energy products. Although the country's hydrocarbon export sector faces competition from domestic demand, Uzbekistan will likely seek to increase its production and export of hydrocarbons during the next decade by expanding its pipelines and modernizing its production facilities and infrastructure. The Government is also likely to continue to form partnerships with Asian and Russian firms to help achieve this objective.

Uzbekistan is likely to increase its production of copper, gold, and uranium. During the past several years, Uzbekistan has made concerted efforts to modernize the Almalyk and the Navoi GMKs and to ramp up their production. Barring unforeseen events in the world economy, Uzbekistan's production of metals and uranium is expected to increase during the next several years. The production of hydrocarbons and refined petroleum products might require additional investments.

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TABLE 1
UZBEKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2010	2011	2012	2013	2014[e]
METALS						
Copper:						
Mine output, Cu content		90,000	91,500	95,600	98,000 [r]	99,500 [3]
Metal:[e]						
Blister		92,000	92,000	93,000	96,000	97,000
Refined		90,000	91,500 [3]	95,600 [3]	98,000 [3]	99,000
Gold[e]	kilograms	90,000	91,000	93,000	98,000	100,000
Molybdenum, mine output, Mo content		500 [e]	557	522	490	450 [3]
Rhenium[e]	kilograms	1,200 [r]	1,200 [r]	1,200 [r]	900 [r]	900
Silver, mine output	do.	59,097	60,000	60,000	61,000	61,000
Steel:						
Crude		731,373	733,400	736,300	746,200	731,000 [3]
Rolled		691,910	709,900	710,500	718,000	703,000
Tungsten, metal		--	48	131	98	83 [3]
Zinc, metal, smelter, primary		40,000 [e]	54,900	61,100	61,500 [e]	62,000
INDUSTRIAL MINERALS						
Cement		6,872,000 [r]	6,698,000	6,800,000	6,990,000	7,350,000
Clays:[e]						
Bentonite		20,000	25,000	25,000	26,000	26,000
Kaolin		500,000 [r]	300,000 [r]	300,000 [r]	70,286 [r, 3]	64,605 [3]
Gypsum[e]		44,000 [3]	48,000	50,000	50,000	35,000
Nitrogen, N content of ammonia[e]		1,344,029 [3]	1,294,300 [3]	1,300,000	1,350,000	1,200,000
Phosphate rock:[e]						
Gross weight		800,000	800,000	800,000	850,000	800,000
P_2O_5 content		187,000	187,000	187,000	198,000	187,000
Potash, K_2O equivalent		33,000	110,000	111,700 [r]	84,600 [r]	110,000
Sulfur:[e]						
Byproduct:						
Metallurgy		170,000	170,000	170,000	175,000	170,000
Natural gas and petroleum		350,000	350,000	370,000	380,000	370,000
Total		520,000	520,000	540,000	555,000	540,000
Sulfuric acid		1,192,600	950,000 [r]	900,000 [r]	900,000 [r]	900,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		198,000	244,000	19,800	20,100	20,000
Lignite		3,102,000	3,600,000	3,730,200	4,069,900	4,377,000
Total		3,300,000	3,844,000	3,750,000	4,090,000	4,397,000
Natural gas, dry	million cubic meters	65,937	63,036	62,911	55,200	55,000
Petroleum:						
Crude:[4]						
In gravimetric units		1,866,000	3,600,000	3,165,000	2,900,000 [e]	2,900,000
In volumetric units	42-gallon barrels	13,600,000	26,200,000	23,000,000	21,200,000 [e]	21,200,000
Petroleum refinery products:						
In gravimetric units		3,296,000	5,000,000	5,000,000	4,800,000	4,800,000
In volumetric units	42-gallon barrels	26,480,000	40,165,000	40,165,000	38,400,000	38,400,000

See footnotes at end of table

TABLE 1—Continued
UZBEKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]	2010	2011	2012	2013	2014[e]
MINERAL FUELS AND RELATED MATERIALS—Continued					
Uranium:					
U content	2,400	3,000	3,000	3,315 [r]	3,401 [3]
U_3O_8 content	2,830	3,540	3,540	3,880 [r]	3,979 [3]

[e] Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r] Revised. do. Ditto. -- Zero.

[1] Table includes data available through September 24, 2015.

[2] In addition to the commodities listed, Uzbekistan was thought to produce a number of other mineral commodities, including aluminum, cadmium, caustic soda, cesium, feldspar, fluorspar, graphite, iodine, iron ore, lead, lime, lithium, manganese, rubidium, selenium, tellurium, and vermiculite, but available information was inadequate to make reliable estimates of output.

[3] Reported figure.

[4] Includes gas condensate.

TABLE 2
UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Cement		OAO Kyzylkumcement	Navoi City	3,100,000
Do.		OAO Akhangarancement	Sirdaryo Viloyati	1,740,000
Do.		OAO Kuvasaycement	Farg'ona Viloyati	1,000,000
Do.		OAO Bekabadcement	Toshkent Viloyati	820,000
Do.		Jizzak Cement Plant (Almalyk mining and metallurgical complex (Almalyk GMK)	Jizzax Viloyati	760,000
Cesium, lithium, rubidium		Shava-Say deposit	NA	NA
Clays:				
Bentonite		Arab-Dasht and Khaudag deposits	NA	NA
Kaolin		Angren deposit	Angren region	8,000,000
Coal:				
Bituminous		OAO Shargunkumir and OAO Erostigaz	Baysun and Shargun deposits, Surxondaryo Viloyati	700,000[3]
Lignite		OAO Uzbekugol and OAO Apartak	Angren deposit, Toshkent Viloyati	4,500,000
Copper:				
Mine output, Cu content		Almalyk mining and metallurgical complex (Almalyk GMK)	Dal'neye, Kalmakyr, and Sary-Cheku deposits	100,000[3]
Concentrate		Almalyk polymetallic beneficiation plant	Qashqadaryo Viloyati	NA
Metal		Almalyk refinery	Olmaliq	130,000
Feldspar		Karichasayskoye and other deposits	Deposits in Samarqand Viloyati, Toshkent Viloyati, and Qoraqalpog'iston Respublikasi	120,000[3]
Fertilizer		Ammophos production association	Olmaliq	NA
Do.		Azot production association	Farg'ona Viloyati	NA
Do.		Elektrokhimprom production association	Chirchiq	NA
Do.		Kokand superphosphate plant	Qo'qon	NA
Do.		Naviazot production association	Navoiy Viloyati	NA
Do.		Samarkand chemicals plant	Samarqand Viloyati	NA
Fluorspar		Agata-Chibargata, Aurakhmat, Kengutan, Kyzylbaur, Naugarzan, and Nugisken deposits	East of Toshkent Viloyati	150,000
Do.		Syrpatash deposit	Namangan Viloyati	NA
Gold	kilograms	Various facilities and deposits, which include:	Of which:	100,000[3]
		Adzhi-Bugutty, Amantaytau, Balpantau, Bulutkan, Donguz-Tau, Muruntau, and Taurbay deposits	Central Qizilqum region	
		Navoi mining and metallurgical complex (Navoi GMK) (Uzbekistan State Committee for Geology and Mineral Resources) Navoi, Uchkuduk, Zarmitan, and Zarafshan gold refineries	Muruntau deposit and 12 others	
		Kochbulak and Kyzyl-Al'ma-Say deposits	Toshkent Viloyati	
		Almalyk mining and metallurgical complex (Almalyk GMK)	Dal'neye, Kalmakyr, and Sary-Cheku deposits	
Graphite		Tadzhi-Kazgan deposit	Navoiy Viloyati	NA
Iron ore		Syurenata deposit	Toshkent Viloyati	NA
Lead, mine output, Pb content		Almalyk mining and metallurgical complex (Almalyk GMK)	Uch-Kulach deposit in Jizzax Viloyati	40,000[3]
Manganese		Dautashskoye deposit	Qashqadaryo Viloyati	40,000
Molybdenum:				
Mine output, Mo content		Almalyk mining and metallurgical complex (Almalyk GMK); Kalmakyr and Sary-Cheku deposits	Toshkent Viloyati	900[3]
Metal		Uzbek refractory and hard metals plant	Chirchiq, Toshkent Viloyati	NA

See footnotes at end of table.

TABLE 2—Continued
UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2014[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Natural gas	million cubic meters	Gazli, Kandym, Khauzak, Kokdumalak, Pamuk, and Shurtan-Say deposits (major)	Amu-Dar'ya basin; Muborak region	70,000[3]
Do.		Itera/Lukoil (Russia), Uzbekneftegaz JSC	Kan-Dam field	NA
Natural gas condensate		Trinity Energy	Ustyurt Platosi region	NA
Natural gas liquids	million cubic meters	Mubarek gas processing plant	Muborak region	28,000
Do.		Shurtan gas-chemical complex	Shurtan-Say deposit, Qashqadaryo Viloyati	137,000
Petroleum:				
Crude		Kokdumalak and Mingbulak deposits (major)	NA	9,000,000[3]
Refinery products		Fergana oil refinery	Farg'ona Viloyati	5,500,000
Do.		Bukhara oil refinery	Buxoro area	2,500,000
Do.		Alty-Aryk refinery	Farg'ona Viloyati	3,200,000
Phosphate rock		Kyzyl Kum complex	Dzheroy-Sardarin Moroccan type; Karaktay, Severnyy, and Dzhetymtau deposits	NA
Polyethylene		Shurtan gas-chemical complex	Shurtan-Say deposit, Qashqadaryo Viloyati	125,000
Potash		Dekhkanabad potash fertilizer plant	Tubegatan Mine, Qashqadaryo Viloyati	600,000
Rhenium		Almalyk mining and metallurgical complex (Almalyk GMK)	Toshkent Viloyati	NA
Selenium		do.	do.	NA
Silver		do.	do.	NA
Do.		Kosmanachi, Okzhetpes, and Vysokovoltnoye deposits	Namangan Viloyati	NA
Steel, crude		Bekabad steel mill	Bekobod region	1,100,000
Sulfur		Almalyk mining and metallurgical complex (Almalyk GMK)	Dal'neye, Kalmakyr, and Sary-Cheku deposits	NA
Do.		Mubarek gas processing plant complex	Muborak region	2,000,000
Tellurium		Almalyk mining and metallurgical complex (Almalyk GMK)	Toshkent Viloyati	NA
Tungsten:		Deposits:	Locations:	1,200[3]
Mine output, W content		Koytash deposit Ingichke and Lyangar deposits Ugat deposit	Northeastern Uzbekistan Zirabulak Mountains Northern Uzbekistan	
Mine output, WO_3 content (0.49%)		Sautbay wolframite deposit	Qizilqum region	NA
Metal		Uzbek refractory and hard metals complex (UzKTZhM)	Chirchiq, Toshkent Viloyati	NA
Uranium, U content		Navoi mining and metallurgical complex (Navoi GMK)	Central Qizilqum region	3,000
Vermiculite	cubic meters	Tebin-Bulak deposit	NA	25,000
Zinc:				
Mine output, Zn content		Almalyk mining and metallurgical complex (Almalyk GMK)	Khandiza and Uch-Kulach deposits, Jizzax Viloyati	NA
Concentrate		Almalyk polymetallic beneficiation plant	Qashqadaryo Viloyati	60,000
Metal		do.	do.	80,000

[e] Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1] Table includes data and information available through September 24, 2015.

[2] Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and locations.

[3] Capacity estimates are totals for all enterprises that produce that commodity.

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